This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

UC-NRLF
$B 229 142

Digitized by Google

Digitized by Google

SB21
M54
1911/12

Digitized by Google

Digitized by Google

Digitized by Google

DISPLAY OF BOXED APPLES, AT ANNUAL MEETING, MINNESOTA STATE HORTICULTURAL SOCIETY, MADE IN MINNEAPOLIS, DECEMBER 5-8, 1911.

Digitized by Google

Trees, Fruits and Flowers

—OF—

MINNESOTA

1912

EMBRACING THE TRANSACTIONS OF THE

MINNESOTA STATE HORTICULTURAL SOCIETY

FROM DECEMBER 1, 1911, TO DECEMBER 1, 1912, INCLUDING THE TWELVE NUMBERS OF "THE MINNESOTA HORTICULTURIST" FOR 1912.

EDITED BY THE SECRETARY,

A. W. LATHAM,

OFFICE AND LIBRARY, 207 KASOTA BLOCK,

MINNEAPOLIS, MINN.

Official Stenographer, A. G. Long, Excelsior, Minn.

UNIVERSITY OF CALIFORNIA
LIBRARY
BRANCH OF THE
COLLEGE OF AGRICULTURE

VOL. XL.

MINNEAPOLIS
HARRISON & SMITH CO., PRINTERS
1912

Digitized by Google

Digitized by Google

☞After reading this magazine, will you please pass it along to some friend who will appreciate it and whom you may perhaps interest to become a member of the society—at least he should derive benefit from its reading. By distributing in this way the twelve magazines received during the year 1911, at the beginning of the next year—upon renewing your membership in the society—you will be entitled to receive postpaid a cloth bound volume containing all the magazines for 1911 and much other interesting matter, with a full index of all its contents, entitled "Trees, Fruits and Flowers of Minnesota," a handsome book for your library and invaluable for reference.

THE MINNESOTA HORTICULTURIST

Vol. 40. **JANUARY, 1912.** **No. 1.**

ANNUAL MEETING, 1911.

Minnesota State Horticultural Society.

A. W. LATHAM, SECRETARY.

We are so accustomed to speaking of our annual meeting as "the best one ever held" that it would seem to have become almost a regular form of speech with us, but from an experience with the society of forty-four years I believe it is literally true that each meeting is a little better than the one preceding, and indeed it should be so as well, as there has been an almost uniform increase of attendance on these occasions as well as an increase in the character and extent of the fruit display connected with it since we began to make one. At the annual meeting closing on the evening of Friday, December 8th, there was certainly a considerably larger attendance than at any previous similar gathering in our state, and as to the fruit display there was never more than half as much fruit on exhibition at the anuual meeting before.

With the opening of the first session of the meeting, which was called promptly on time, at 9:30 A. M. Tuesday, there were fully four hundred in the hall. Every feature of that morning's program was carried out exactly as announced in the program, and with such spirit as to make in every way a fitting opening for this great meeting. Succeeding sessions followed with varying degrees of interest and attendance, depending upon the character of the program. If those in attendance at the meeting were not interested in discussing strawberries there was opportunity in the fruit room below for the doing and considering of many interesting and profitable things, and there was always a large proportion of the members occupied in the fruit room..

17217

Digitized by Google

If the subject of flowers was not an interesting one, as it came up, why, there was recourse to the fruit room, and things to be seen and done there, but as a rule the hall was comfortably filled at all times during the meeting. The climax of the meeting was probably on Thursday, there being an especially large attendance at the session devoted to top-working, which subject, more than any other, seemed of special interest to our members.

General view of fruit room at Annual Meeting. Prof. N. E. Hansen in the center, Mr. Thos. Redpath at the left.

The bee-keepers met in an adjoining room on Thursday and Friday, but their presence there seemed to have no appreciable effect on the attendance in the main room.

It is very unusual to have many numbers on the program of our annual meeting absent, but this was unfortunately the case this year, sickness and unexpected circumstances having detained away from the meeting perhaps a dozen who were on the program and fully purposed to be there. There was so much interest in the subjects presented and so much new matter coming up continually that there was not a moment's time lost, however, and, indeed, if the full program had been presented it would appear that some things must have been neglected that needed attention.

Thursday afternoon a commission connected with the Land Show made an appeal for the transfer of the fruit exhibit from our meeting

Digitized by Google

to that show, to be held in St. Paul the following week, and arrangements were made to that effect, many of the exhibitors contributing their fruit and others supplying it to the management at a minimum price.

Few resolutions were presented at the meeting, the only one occurring to the writer at this time being one requesting the placing of a lecturer on horticulture with every institute corps operating in the state, which resolution passed unanimously and has since been sent to the superintendent of institutes.

There were many visitors from abroad at the meeting, whose presence was exceedingly welcome with us: Prof. S. A. Beach, from the Iowa Agricultural College; Prof. Jas. G. Moore, from the Wisconsin Agricultural College; Prof. N. E. Hansen, of the South Dakota Agricultural College; and Prof. C. B. Waldron, of the North Dakota Agricultural College. Chas. G. Patten, the well-known fruit breeder, of Charles City, Ia., spent two days with us at the meeting, as did also Dr. H. M. Speechly, representing the Manitoba Society. Of course Mr. Philips and Mr. Kellogg, of Wisconsin, were with us as usual, and many others also from outside of our borders, too long a list to note here.

There were over 600 entries in the fruit display, an extraordinary showing, and presaging a large exhibit, in which we were not disappointed when the fruit was prepared for display. These entries include 320 single plates of apples, twelve collections of named varieties of apples, fifteen collections of top-worked apples, forty-seven bushel boxes of apples, fifty-seven pecks of apples, eight-four seedling apples, also fifty-three entries of grapes and thirteen of nuts. Nearly all of these entries showed up in the exhibit, making a wonderful display. Besides the above there were about one hundred bushel boxes of apples shown by the exhibitors without compensation or award of any kind, an exhibit made from their interest in the work of the association. I regret not having at this writing the details as to this gratuitous display, but hope a little later to make note of it in the Secretary's Corner. Two photographs were taken and appear with this number, which will give an idea of the general appearance of the exhibit. The bushel boxes of apples were displayed on a rack against the back wall of the fruit room, making a brilliant and appropriate setting.

Decorations of the room, as also of the hall above, were somewhat as usual, everygreen sprays and roping with appropriate designs. The platform was adorned with decorative plants, and everything done to make a suitable setting for the purposes of the meeting.

Demonstrations, which had been arranged through the kindness of Prof. Cady, and carried out as planned by his associates connected

Digitized by Google

with the Agricultural School, consisting of fruit packing, grafting, spraying, pruning, etc., all took place as planned for, and the usual interest appeared in connection with them. Our annual meeting has come to be a great school in which many things are taught and great opportunity offered for the study of practical horticulture. How can you, dear fellow member, afford to miss such a meeting? Of course the papers presented and discussions all appear later in the monthly magazine issued by the society, and the bound volume of the annual report, but it is, after all, not like being on hand and receiving the inspiration which can never be had from the perusal of cold print. You should plan from now on to be with us at the next annual gathering. Get your neighbors to come! If they can't came, at least get them interested to become members of the society and receive the report, magazines and plant premiums provided for all members; a wonderful opportunity to acquire interest in this art which contributes so greatly to the comfort and enjoyment of every one who practices it.

This report would be incomplete without reference to the three lantern talks, a gratuitous service by members of the society, Prof. N. E. Hansen, on Tuesday evening, showing a large number of new and interesting views connected with his foreign explorations and many of his new fruits; Prof. Lange showing a large number of views of wild flowers taken in his excursions through the woods; and Rev. Rett E. Olmstead a most beautiful display of birds and bird life. All of these exhibitions were accompanied by appropriate talks illustrating the subject, giving us not only most interesting entertainments but much practical information as well.

The annual banquet was an extraordinary success, two hundred and twenty sitting down at the table, something like sixty more than at any previous similar occasion. The program was carried out in full without a hitch, and appears herewith.

Toastmaster—A. J. Philips, West Salem, Wis.

1. Song - - - - - - - - - - - Minnesota Quartet
2. Heterogeneous hallucinations after twenty years of horticultural hieroglyphics—what does he mean by that? A. G. Long, "Our Reporter."
3. Reading - - - - - - - Miss Erma Baker, Minneapolis
4. Tis said, "Tis more blessed to give than to receive"—the nurseryman does a little of both. F. X. Ferodowil, Wayzata.
5. Song - - - - - - - - - - - Minnesota Quartet
6. "Uneasy lies the head" of him—who does the bidding of a thousand state-wide masters. A. D. Wilson, Supt. Farmers' Institute, St. Anthony Park.
7. Song - - - - - - - - - - - Minnesota Quartet
8. A Sermon in Chalk by "Bart," of the Minneapolis Journal.
9. Here's long life to the Horticultural Society—where a woman may vote. Mrs. Clarence Wedge, Albert Lea.
10. Song - - - - - - - - - - - Minnesota Quartet
11. "Everbearing"—magic word! But why stop with the strawberry? Chas. F. Gardner, Osage, Iowa.
12. Reading - - - - - - - Miss Erma Baker, Minneapolis
13. Song - - - - - - - - Trafford N. Jayne, Minneapolis
14. New and better fruits and flowers are well worth striving for—so are some other things. Geo. E. Vincent, President Minnesota State "U."

Closing song—All joining.

Digitized by Google

Top-Working.

HENRY DUNSMORE, OLIVIA.

In my estimation top-working is of great importance to progressive horticulture in the Northwest. I have not come to this conclusion through the reading of articles on this subject, or from theories presented by different men, but from years of discouragement in trying to raise Japanese plums, of which I have: Abundance, Burbank, Wickson and Satsuma. For eight years I have grown those four Japanese varieties, giving them special care to carry them over winter by wrapping with burlap—and some winters I boxed them up entirely —but all to no avail, as every spring found them killed back badly, In some instances the tops were not killed entirely, but the fruit buds were so badly injured that they could not push forth. So after eight years of expectation I have to say with Burns

"The best laid schemes of mice and men go aft aglee
And leave us naught but grief and care for promised joy."

When I planted those Japanese plums it was with a full knowledge as to their lack of hardiness, as this was my second venture with the Japanese plum. I wanted to grow them for the special purpose of making crosses with some of our best native varieties, and thought by giving them special care I could carry them through to the fruiting stage. But so far I have not raised a single plum on the original trees.

In the spring of 1907, while I was examining those trees, I found that the Satsuma was killed back to the snow line and only one small branch, which was weighted down to the ground, showed signs of vitality.

After four years of this non-progressive work, I determined to test the theory, does top-working increase hardiness? I took all that was left of the Satsuma and grafted it into the head of an Aitkin plum. The graft made a fair growth the first season, and the following winter it killed back about two inches at the tip. For the last three winters it has suffered no injury whatever, while the original tree kills back every winter. This experiment, although on a very small scale, has demonstrated to my satisfaction that I can grow Japenese plums by top-working, but I cannot on trees as they are usually grown.

The Satsuma top-worked on Aitkin produced a few nice plums in 1910. In 1911 it produced a full crop of very highly colored fruit. It is a late bloomer, which is an advantage in this climate. With me the fruit ripens about the 20th of July. If, as some of our highest authorities tell us, it is next to impossible to make a tender variety

Digitized by Google

hardy, why should the argument of doubtful hardiness stand in the way as a stumbling block to more and better fruit when we can take those half hardy varieties and successfully graft them into the head of a tree that has the following qualities: it must be adapted to the variety we intend to grow; it must be possessed of early maturing qualities; it must have the hardiness to defy our winters? With this combination we can accomplish in a few years what some of our scientific men tell us would require ten thousand years through seed production of tender varieties alone, the growing of more and better

Harry Dunsmore's residence

varieties of winter apples that cannot profitably be grown in the usual way in this climate.

Thirty years ago, if a man had made the declaration that he could speak and his voice could be heard 500 or 1,000 miles away, he would have been put down as a fit subject for an insane asylum; today we know it is a fact, if not directly, indirectly through the medium of the phone. Is it not just as reasonable to suppose that we can take those half-hardy varieties of fruit trees and by top-working them into the head of a stock that is congenial to it, possessed of hardiness and early maturing qualities, that we can transfuse into that scion a flow of plant life that will enable it to fortify itself against winter injury by the early maturity of its wood, thus giving the wood time to harden

Digitized by Google

before severe freezing weather sets in? In fact this is the dividing line upon which hangs the term "hardiness." The tender varieties don't know when to stop growing in this climate and when winter comes along it finds them still wearing their summer dress. Our hardiest varieties do know when to stop growing and prepare for winter in good season.

I would suggest that we combine our forces and put one-tenth of the time into actual practice that has been lost in arguing the question of hardiness. If you do, along the lines that I have suggested, you will have accomplished something of real value to yourself and also to the state of Minnesota.

What is true of the plum with regard to top-working is also true of the apple. As a grower of fruit for the last twenty-five years, and for the past fifteen years a keen observer of the effects resulting from top-working, my experience has convinced me that a full supply of true winter apples is within our reach through the medium of top-working. I will mention a few varieties grown in my orchard: Jonathan, top-worked on Peerless, small, on Virginia crab, small, on Hibernal undersized—bears well on all three; Grimes Golden on Peerless, medium size, on Virginia, large, on Hibernal, medium—bears well, quite profitable; Malinda on Peerless, fruit large, bears immensely; Pewaukee on Gideon seedling, fruit large, bears well; Wolf River on Gideon seedling, twenty-three years old, thirty feet spread, top-worked fifteen years ago—fruit large, bears abundantly, much more profitable than trees of the same variety grown in the usual way.

REPLANTING OLD ORCHARD.—On the site of an old orchard last spring after the field had been staked out, and the holes dug large and deep, some good, fresh, virgin soil was hauled from a piece of timber land and about a bushel of it was put at every hole. The trees were set right in the new soil; they started in a very short time, and made a splendid growth. These trees were set in a field that had been planted to vetch the previous fall, so after the trees started and vetch was large enough it was plowed under. The weeds were kept down by frequent harrowing, until it was again time for the sowing of vetch, which in turn was turned under. It is my belief that the trees will develop finely if the application of vetch is continued, even though the soil is of the lightest sandy texture.—Michigan.

Digitized by Google

Notes on Breeding Fruits.

CHAS. G. PATTEN, FRUIT BREEDER, CHARLES CITY, IA.

It gives me pleasure to present some photographs of the breeding work on my grounds, which are most illuminating and assuring of the real certainty of our being able to breed specific characters in our trees and fruits that has ever come within my reading or observation.

Trees with leaves on Nov. 15. Origin, Old Red Siberian and Bailey Sweet cross; Briars Sweet, (Siberian hybrid) Pound Sweet cross.

It was exceedingly fortunate for me, and, I am sure, for horticulture as well, that the origin of the Briars Sweet crab, or more properly, hybrid, came to my knowledge in early manhood.

This view of three trees with the leaves on, taken November 15th, is a part of an experiment begun twenty-three years ago last spring. This second one, with leaves all off, began about eighteen years since.

The parents of the Briars Sweet were the small, old Red, and somewhat acrid, Siberian crab apple, which was naturally pollinated by the Bailey Sweet apple. The limbs of these two sorts hung together, and, as I remember it, no other trees in the little yard were old enough to bear at that time. Mr. Briar, the owner, planted seeds of the Siberian, and the Briars Sweet was the result.

Any one who is acquainted with the Bailey and the Briars Sweet, and especially those whose memory goes back to the little, old Red Siberians, can readily see the dominating influence of the Bailey Sweet, in the new cross, over the Siberian. The trees here shown are the farther product of a cross of the Pound Sweet apple on the Briars Sweet.

Now note the results and the facts, or principles, which they establish. The dominating, specific, sweet character, seen in the first cross by the Bailey Sweet, when reinforced by the Pound Sweet, pro-

Digitized by Google

duced seedlings which unfailingly produced sweet apples, and three out of seven seedlings as fully as good as, if not better in quality than, either parent. So in this case the certainty of specific breeding in tree fruits is fully apparent.

But the real signficance of this view is only half told. Look at the leaves hanging on those seedling orchard trees on November 15th. What is the reason? Why, the two dominating parents in that compound were born on the Atlantic coast, and so do not ripen their wood and shed their leaves sufficiently early to render them hardy, or adapted to this interior climate. Hence, dominating, as they have in

Origin Red Siberian with (doubtless) Talman Sweet; Richland Winter Sweet, Russian Green Sweet cross. Leaves off Oct. 15.

this cross, none of their seedlings are fully hardy here. However, some of their seedlings, having in them the recessive character of the hardy Siberian, will undoubtedly produce trees fully hardy and bearing sweet apples.

Now note the contrast in this view of eight seedlings, with the leaves all off on October 15th. They are the product of a cross between the Richland Winter Sweet crab, or hybrid, with the Russian Green, an early sweet apple, a tree that we call perfectly hardy and free from blight of trunk or limbs.

The Richland Winter hybrid is an accidental seedling originating in Richland county, Wisconsin. It was disseminated by Geo. W. Putnam, of Ash Ridge, in that county, some time in the eighties. It is a hardy tree, nearly free from blight, fruit fully as large as Tran-

Digitized by Google

scendent, partly red, sweet and good. Season about October and November. The parents of this tree were no doubt the Red Siberian pollinated by the Talman Sweet apple. No other sweet apple, grown in that part of Wisconsin, was hardy enough to produce a sweet hybrid of such hardiness and quality. Another conclusive reason is, that no other apple than Talman Sweet could so stamp its color on the seedlings of this hybrid between Richland Winter and the Russian Green as seen in the fruit of their seedlings, and at the same time produce

Patten Greening and Ben Davis cross.

such hardy trees. Both the sweet apples, being light, or green, in color, have dominated color entirely, and also the specific sweet character, as in the first experiment. No more conclusive proof of the value of scientific breeding has ever been offered than is portrayed in these two experiments.

I present here two other views which will help to farther illuminate this important breeding problem. In both views, the Patten Greening is the seed producing parent. In one, the Ben Davis is the pollenizing parent; and, in the other, it is the Black Annett.

These photographs were taken out of the middle of seedling rows to show the marked difference which there is in individual seedlings of the same crossing.

Digitized by Google

Every orchardist can see at a glance the great economic value of one form over the other. One tree in each view will, when it comes to bear, have to be tied or propped, or both, to keep it from splitting in pieces, while the other will carry a great load of fruit, bearing its limbs to the ground without breaking.

It is scarcely necessary to say, to any intelligent body of horticulturists, that the lessons drawn from these views will some day be applied to the breeding of specific forms of beauty and utility in trees

Patten Greening and Black Annett cross

which will add untold values to the orchards and ornamental trees of the world.

The principles involved in the views which are here presented have a significance which not only invites but commands the attention of the restless, pushing spirits that dominate the age in which we live.

Digitized by Google

The Beta Grape and its Origin.

WM. PFAENDER, JR., NURSERYMAN, NEW ULM.

I do not remember ever having read in horticultural papers, or having heard, of the originator of the Beta grape until several years ago, when by mere accident I ascertained the originator as I will show later on. Thinking that this person should be better known, I arranged with our worthy secretary to make this matter the subject of my paper. If what I am going to say will interest you and assist in giving credit where credit is due, I shall have accomplished all that I set out to do.

In the "Western Fruit Grower" of March, 1906, page 158, there appeared an article by Mr. C. B. Camp, of Nebraska, on "Breeding Hardy Grapes in the West." In this article Mr. Camp stated that for his crossing work he had secured several good grapes as foundation stock, among them the *"Dacota"* grape from J. Smelter, of Carver, Minn., which was said to have withstood forty to fifty below zero without injury. T. V. Munson, of Texas, in his book, "Foundation of American Grape Culture," also refers to these hybrids.

Being interested in growing hardy grapes I wrote to Mr. Smelter, at Carver, regarding the Dakota grape and received an answer from Mr. Jac. Suelter, who, I afterwards ascertained, is the son of Mr. Louis Suelter, the *originator* of the Beta and other grapes. This correspondence finally resulted in Mr. Jacob Suelter coming to New Ulm and turning over to me the entire stock of Dakota grapes then in his possession, stating that his father in later years considered the Dakota the best of the grapes later on described. He also had with him a lengthy article, published in the Minneapolis Freie Presse, of October 18th, 1884, a German paper, in which his father described his hardy grapes.

The time allotted is too short to permit me to give the complete article, but I will supply a copy of my translation in full, to any one desiring it; and I will here give a synopsis of the article written by the originator. He states that he tried for years to improve the wild grape but had no reward from his experiments except that he produced a very sweet, early and good bearing wild grape that ripened its fruit early. As the berries were not of the desired size, he conceived the idea that if he should fertilize the flowers of this wild sweet grape with the flowers of the Concord, which is not hardy here, he might produce a hardy grape that would be larger than the wild ones. He says: "I think it was in 1870 when I made this hybridization and

Digitized by Google

grew fifteen seedlings. In 1881 they flowered the first time, and as the year 1881 was the severest year for mildew that I have witnessed in twenty years the majority of these seedlings were affected with mildew. Five of these seedlings were free from mildew, and I destroyed the others.

In 1881-82-83 these plants bore fruit, and I have not discovered any mildew or rot on any of the berries. To show how early these hybrids are I will give the date of flowering and ripening of fruit, as follows:

1881	No. 1	begins	to	blossom	**May 26,**	shows color	**July 31.**
1881	No. 2	"	"	"	May 27,	" "	Aug. 4.
1881	No. 3	"	"	"	May 30,	" "	Aug. 8.
1881	Delaware	"	"	"	June 8,	" "	Aug. 15.
1882	No. 1	begins	to	blossom	June 18,	shows color	**Aug. 20.**
1882	No. 2	"	"	"	**June 14,**	" "	Aug. 24.
1882	No. 3	"	"	"	June 15,	" "	Aug. 29.
1882	Delaware	"	"	"	June 26,	" "	Sept. 4.
1883	No. 1	begins	to	blossom	June 24,	shows color	Aug. 22.
1883	No. 2	"	"	"	June 24,	" "	Aug. 28.
1883	No. 3	"	"	"	**June 21,**	" "	Sept. 2.
1883	No. 4	first	flowering		June 23,	" "	**Aug. 17.**
1883	Delaware	first	to	blossom	June 27,	" "	Sept. 4.

Then he describes how he knows that the hybridization has actually taken place, and states that in 1883 the first hard frost was on September 10th and that the wood of these hybrids was perfectly matured. He mentions a number of reasons why these hybrids are valuable, etc. He states that he named them, Beta, Monitor, Dakota and Suelter.

Desiring to know more about these grapes, I took a trip to Carver on March 9th, 1908, and secured cuttings at the original Suelter home and also from two other parties at Carver who had the Suelter grapes. Having secured cuttings from what were supposed to be eight different plants, I numbered them 1 to 8. I have these all planted separately, and all of them have borne a good crop this year with the exception of one of them, No. 1, which was called a half-breed by the party it was taken from. I take it for granted that it will be interesting to know more about these hardy grapes, and will say that I have kept memoranda of these eight numbers and compared them with the Beta and the original Dakota.

I have the Beta from three different sources and find that I have two kinds of Beta, one shedding its leaves earlier than the other and bearing better, while the one that defoliates later is a more vigorous grower.

Digitized by Google

In comparing notes I find that the Dakota defoliates fully two weeks earlier than the early defoliating Beta, and the fruit of the Dakota is sweeter than that of all the others. The Dakota can be easily distinguished from the Beta, first, by the sweet taste, and, second, by the fact that when the berry of the Dakota is picked off the stem the stub shows a greenish white color, while that of the Beta is red.

In comparing my Betas with the plants I procured from Carver, I find that the early defoliating Beta is like my No. 3 and the late one like my Nos. 2 and 8, and from these observations it is my opinion that two different Carver grapes were sent out when they were originally distributed as Beta.

The originator, Mr. Suelter, speaks of five plants but names only four, and I think I have the fifth one in my No. 1 which I took from Mr. Klevis' place, as that is different from all the others. It has a small round cluster and ripens later than any of the others and is not such a vigorous grower, with thin vines, and I think for this reason Mr. Suelter did not propagate and distribute it, for we did not find it on his place.

Although these Carver grapes are perfectly hardy, it is advisable to protect them the first winter after planting.

In conclusion I desire to say that Prof. T. V. Munson, of Texas, states in his book, "Foundation of American Grape Culture," that Mr. Suelter used a native white fruited variety of Vitis Vulpina (Riparia) to produce these hybrids. Upon inquiry on this point, Prof. Munson advises me that Mr. Suelter so stated to him, and, in fact, sent him plants of this native white variety which bore small compact clusters 2 to 2½ inches long of good quality. This seems to explain why the wine made of these grapes is not as dark in color as that of our native black grapes.

FERTILIZING AN APPLE ORCHARD.—Bulletin No. 339, New York Agricultural Experiment Station, Geneva, N. Y., deals with the results of an experiment conducted for fifteen years to determine whether or not it is necessary to fertilize apple orchards. The conclusion briefly is that "trees in this experiment would have been practically as well off had not an ounce of fertilizer been applied to them." The soil used was a clay loam too heavy for a good orchard soil. It is impossible to any more than refer to this bulletin, which our readers will find of sufficient interest to pay for the trouble of requesting a copy.

Digitized by Google

Trees and Tree Planting.

W. A. BURNAP, DELEGATE, N. E. IA. HORT. SOCIETY, CLEAR LAKE, IA.

The poet Thompson sings:

"Welcome ye shades! Ye bowing thickets hail!
Ye lofty pines! Ye venerable oaks!
Ye ashes wild resounding o'er the steep!
Delicious is your shelter to my soul!"

Every true spirit answers that call, and false the man, wanton the woman and fickle the child who cannot join the chorus.

I love the woods but adverse fate placed my home on the rolling land of the Wisconsin drift in northern Iowa. West from where I settled this land tumbled away clear to the upper Des Moines river, forty miles distant, without a tree to mark the course of the stream or shade the grasses and flowers of its virgin prairie. Across this tumultuous ocean of land, fires swept, blizzards howled, and no foot save that of the hunter or his prey trod its lofty swells or grass-tangled valleys.

Now all is changed, the Swede and the Dane, the Irishman and Norwegian, the English and the German, have settled, made homes and buried their national differences under the broad cover of American citizenship. True to the sentiment commencing this paper, nestled around their homes, scattered about their churches, protecting their schools and marking their farms, are trees, groves and shelter belts, which have so beautified the land that many times when achieving some high spot that commanded a broad view, I have been compelled to stop my team and admire the scene. At such times I have been reminded of the lines Scott puts in Rhoderic Dhu's mouth when addressing Fitz James:

"Stranger, from yonder mountain heights,
I saw thee send the lighted eye,
Far to the south and east, where lay,
Extended in succession gay,
Deep waving fields and pasture green,
With gentle slopes and groves between.
This fertile plain, this softened dale,
Was once the birthright of the Gael,
But Saxon came with iron hand
And from our fathers reft the land."

We have but to substitute the Indian with his blanket and tomahawk for the Gael with his tartan and claymore, and this description, and facts, would fit this land of mine as well as the beautiful lowlands of Scotland.

What matters it to me, if in the haste or poverty of these settlers they have made mistakes and planted willow, poplar, cottonwood and

Digitized by Google

locust where they might have set pine, spruce, ash and elm? They have made homes where there was only savagery, planted churches where there was only desolation, and builded schoolhouses where only the wolves howled. May peace, prosperity and plenty be with them, and a better arboriculture come with more thorough knowledge and more abundant means!

What a wonderful flora this land of ours possesses! Like a fair dream comes to my mind a trip I once made in winter from our bleak north, south and still southward, until the Southern Cross blazed to my view in the sky, shining over the hills and dense forests of Yucatan. Many were the objects of interest that this long trip presented, buildings, towns, people, language, customs, but to me above all else in interest were the rapidly changing flora. When I started, the woods and fields of Iowa were bleak and bare and brown, its last year's foliage scattered by the winds of Heaven. Southward, when past the general line of the Ohio River, I found myself hunting, and successfully hunting, from the car window for mistletoe, which parasite followed me to the Gulf. Below the east and west line of Vicksburg, swamp oaks, cypress and tupelo gums claimed my attention, while Spanish moss swung from many trees in damp locations.

On reaching the Gulf shore, magnolias, live oaks and other evergreen trees had so reinforced their kindred that the woods presented almost the summer hue of our northern forests. Further south, approaching the north coast of Yucatan from the bay of Campeche, even in mid-winter, the land presented a perfect mass of green. Deciduous trees have entirely disappeared, evergreens alone remain; palms of many kinds reach their heads towards the sky; mahogany, rosewood, zapote, chicle, pupa and chinchara trees reach their oak-like heads hundreds of feet in the air, while cinchona palms, logwood and thousands of vines and creepers fill the undergrowth. So luxuriant is the forest flora that should one wish to go in any direction not previously worked or traveled it would be necessary to employ the peon and his machete, and with his help, and steady work, eight rods' progress might be made in a day—a day, however, filled with wonder at the strange, gigantic and beautiful growth there found, not the least of which would be the abundant, ever present, orchids, which swing attached to almost every tree, living or dead. So varied, beautiful and abundant is our native flora, north and south, and so easy and kindly to transplant, that the filling of the streets and parks of our towns and cities with trees, set for ornament and beauty, which are fit only for the woodpile, is a malfeasance of the very worst character.

Digitized by Google

Yet how often is this sin committed! At the newly progressive city of Mobile, I found them setting in their streets and parks, for shade and beauty, that tree that Orange Judd said, with good reason, should be planted not nearer than fifty miles apart here or anywhere—the Lombardy poplar; this being done notwithstanding that beautiful magnolias, grand live oaks and magnificent tupelo gums could be had in the woods for digging. In your own Minnesota I know a town builded in a region where all kinds of oak, elms and hard maple are indigenous, hardy, plenty and beautiful, and yet its streets and lawns are filled with dirty, scraggly, insect-infested box elders. These towns are not exceptions. You will find their companions in nearly every county, in every state of the south and west. To you gentlemen of this society the problem is respectfully submitted, that your young men and children be taught not only to plant trees but to plant with judgment, having in view not today but the years to come.

The reasons for tree planting are many. I once furnished a few such to a friend for an Arbor Day edition of his paper, and as the reasons then in Iowa will apply now in Minnesota, I will close by repeating them here and allow this meeting to proceed to better things.

"WHY PLANT A TREE?"

Why plant a tree? Because the birds,
  That "trance the listening air,"
May nest among its rippling leaves
  And sing your praises there.

Why plant a tree? Because the beasts,
  As seasons come and go,
May shelter underneath its boughs
  And their mute thanks bestow.

Why plant a tree? Because you may,
  As aging years invade,
Eat of its fruit, admire its form,
  Or rest beneath its shade.

Why plant a tree? Because your son,
  And his son's son again,
For this alone in future years
  May rise and bless your name.

Why plant a tree? 'cause God Himself
  A garden set of old,
And if you follow in His way
  You'll find, mayhap, His fold.

So then if God, and child and you,
  And beast and bird agree,
Why man! get up and hunt that spade
  And go and plant a tree.

Digitized by Google

Evergreens for the Dryer Sections of Minnesota.

PETER SIVERTS, CANBY.

It is now over thirty years since I commenced planting evergreens here in Yellow Medicine county, only a few miles from the South Dakota state line. At that time it was considered almost an impossibility to get evergreens to grow here on these open, wind-swept prairies; still by raising them from seed, transplanting often and carefully, I had quite fair success.

The first varieties tried were Austrian pine and Norway spruce; of these the pine proved the hardiest, but the spruce did fairly well also, especially where not exposed too much to the wind. Many of this first planting are to be found all over the neighborhood and, as a rule, are fine, healthy looking trees.

Since then I have experimented with the following additional varieties: Scotch pine, white pine, jack pine, bull pine and dwarf mountain pine, also white spruce, Black Hills spruce, Douglas spruce, balsam fir, red cedar and arbor vitæ.

The Scotch pine has done well, is a rapid grower, transplants easily and is a very pretty tree when young, but as it gets older it has a tendency to get open and more or less crooked and scraggy, and so is not so desirable for ornamental planting, but is one of the best for windbreaks. The Austrian pine grows a little slower than the Scotch, but is straighter and more dense and a darker green in foliage, transplants almost as easily and is a good tree, both for windbreak and ornamental planting.

The white pine appears to be more tender and seems to suffer more from the drying winter winds, turning red towards spring nearly every winter and sometimes killing back considerably; in fact all the pines are liable to turn red towards spring, but not so often and generally recover entirely. Right here is a peculiarity which I have never been able to account for; for instance, one year the Scotch pine will turn very badly and the Austrian will stand perfectly green, while another year this, perhaps, will be reversed.

The jack pine, though a rapid grower, is so open and crooked and has such a poor colored foliage that, although it seems quite hardy, I would not recommend planting it to any extent. The bull pine resembles the Austrian very much and is, no doubt, very hardy when well established, but on account of being so hard to transplant it is very difficult to get a good stand. The mountain pine, although a slow grower and spreading of habit, seems to be well adapted to prairie planting. It is easy to transplant and holds its bright green color

Digitized by Google

well the year round. It makes a pretty hedge and can be used to good effect for single specimens on the lawn in places where a tall-growing tree would not be desirable.

The white spruce is one of the hardiest and most easily transplanted evergreens we have and stands all kinds of exposure but, like all the spruce family, makes a slow growth the first five or six years.

The Douglas spruce seems to be extremely hardy when well started. It is kind of open and irregular of habit while small but improves with age and generally develops into a beautiful tree. I think

Residence of Peter Siverts, at Canby. He practices what he preaches.

it will prove one of the most desirable evergreens for this western country.

The Black Hills spruce resembles the white spruce very much in form and habit, but has a somewhat darker foliage and is very hardy.

The blue spruce is, perhaps, the hardiest of all the evergreens and also the prettiest; is rather slow growing, but quite spreading and generally has a beautiful, symmetrical farm. They, however, are not all blue, a large percent of them remaining green. In the spring they are most always all green, and it is only by marking the blue specimens in the summer that these can be identified in the spring. It is the latest of the evergreens to start sprouting in the spring, which renders them less liable to be injured by late frost.

The balsam fir seems to do well here, is a very pretty tree and, as far as I have observed, stands about as well as the other evergreens.

Digitized by Google

The red cedar if from northern grown seed is very hardy and does well here, but from southern seed it winter-kills entirely.

The arbor vitæ is too tender here, unless grown in a very sheltered place and not allowed to go into winter in too dry ground.

Now as to transplanting—that is where the failures commence. The whole evergreen family, unfortunately, is of this nature, that their roots do not stand being exposed in the least; the resinous sap sets so quickly, especially in these strong prairie winds, that it is necessary to use the utmost care in handling them. Puddling the roots in a thick mud bath as soon as lifted from the ground, and immediately heeling them in in moist ground, and when ready to plant again puddling them is the best way I know of.

Peter Siverts' orchard protected on the north by evergreen windbreak.

As to planting, the rule that holds good for other kinds of trees holds good for evergreens, the whole secret is in keeping the roots wet from the time they are dug till they are planted again. Be sure and pack the earth well among the roots, and when well covered tramp it firmly, and then throw a little loose dirt on top. If planted in a row for a windbreak or to form a grove, they should be cultivated often till about the first of August and especially after a heavy rain. Hoeing occasionally will also be necessary. I generally use a five-shovel, one-horse cultivator, and follow with a fourteen-tooth drag implement. In planting larger specimens on the lawn, be sure and dig the holes large enough so the roots will go in without bending, and proceed the same as with a small tree. If the ground should be dry it is necessary to water; but plant your tree first and after having tramped the earth firm and solid, and before quite filling the hole, apply the water in the

Digitized by Google

basin thus formed until it is filled, and then when the water has well settled, say in a few hours, throw on more loose, dry dirt, but do not fill the hole completely. Don't pour the water on the foliage as you are liable to kill the tree. If it is a very dry season it may be necessary to water two or three times a month, but always do it by flooding the basin around the tree, and preferably in the evening, and next morning take a rake and break up the crust that is likely to form, or else throw on a little mulching of lawn clippings or something.

The main thing in keeping an evergreen thrifty on a lawn is to widen this basin a little every year for a number of years and keeping the top soil loose and free of grass and weeds. Don't remove the lower limbs, let them grow clear to the ground.

Annual Report, Executive Board, 1911.

WYMAN ELLIOT, CHAIRMAN, MINNEAPOLIS.

The executive board has held three meetings the past year, the first of which was held on the last day of the last annual meeting. The only business performed, as the records show, was the election of the secretary. The board was in session at this time, with Mr. A. F. Woods, dean of the Agricultural College, having under consideration matters pertaining to the common interests of both the society and the institution of which Mr. Woods is the head.

The next meeting was held on the evening preceding the annual summer meeting, at which six members of the board were in attendance. The secretary's accounts for the preceding six months were examined and approved, also the account of the treasurer for premiums paid out at the previous annual meeting, and a resolution was introduced and unanimously adopted urging the superintendent of farmers' institutes to provide each institute corps in service in the state with a lecturer on horticulture, and also approving of the proposed plan of locating horticultural schools of a week's duration at convenient points. The third meeting of the board was held on Monday evening last, at which the accounts of the secretary for the preceding six months were audited and approved, also treasurer's account for premiums paid at summer meeting. Many matters of interest to the society were talked over which will have material effect on the general character of the work the society is performing, but no special action was formally taken.

I am pleased to report that as a result in part at least of the resolutions adopted by the board, each one of the four corps of in-

Digitized by Google

structors now at work with the farmers' institute, commencing service yesterday, is provided with a lecturer on horticulture; Mr. A. Brackett and R. A. Schutz who have done previous service of this character, Mr. F. H. Gibbs and Mr. Dewain Cook, who are performing service of this sort for the first time. These gentlemen are all well known as authorities on the subjects they handle, and we expect valuable results from their work. The movement to establish horticultural schools at different points in the state is taking form, and quite a number, we understand, have already been decided upon. Members who are interested in the opportunities that these give for practical instruction in the arts of horticulture, fruit growing especially, and desire such schools in their neighborhood, might correspond with Supt. A. D. Wilson, at St. Anthony Park.

Special attention should be called to the large and important work now well under way at the fruit-breeding farm, under the management of Supt. Chas. Haralson, and the annual report which will be made later in this meeting is especially commended to your careful consideration. This farm is very accessible, being on the St. Louis road, twenty-three miles from Minneapolis and five miles west of Excelsior, located about one-fourth mile south from the Zumbra Heights station. This farm, in a sense, is the focusing of the efforts of this society, extending over a long period of years, to secure new fruits adapted to this region. Your earnest co-operation in forwarding this work is earnestly desired. Any valuable seedling fruits that you know of should be tested at this station, and this may be safely done, as whatever is received for testing will be carefully guarded.

We note that the membership of the society has fallen off a little the past year, but this is not in any sense a discouraging feature with us, the peculiar conditions of a year ago resulting in little or no fruit from most of our orchard trees, and other kindred causes, being undoubtedly at the bottom of it. Returns coming in for the year 1912 indicate a revival of interest in the society, and with the assistance of the members, each one of whom may by necessary effort send in one or more memberships, will insure the usual or even larger increase than usual in our membership during the coming year. The nurserymen alone are in a position, profiting as they do largely from the strength and practical workings of this society, to add very materially to the membership. With an increased printing appropriation made by the last legislature such an increase can be cared for up to its probable limits.

Digitized by Google

A Plea for Our Wild Flowers.

PROF. D. LANGE, ST. PAUL.

(Illustrations by the author.)

Every lover of the beautiful loves flowers, which is only another way of saying that all people love flowers. But flowers may receive too much love as well as too much light and heat. Several of our most attractive wild flowers are in danger of extermination over wide areas because they have too many admirers whose love is too fervent for the flowers to endure.

On a walk in early summer, you have turned aside from the road and the well-trodden path and are enjoying a ramble in real nature through the young ferns, the grasses and all kinds of wild growth. With an exclamation of joy you gaze at a picture set in the small clearing. It is a clump of Showy Moccasins, the state flower of Minnesota. How delicately the blush of red blends with the white on the large petal, while the smaller petals and sepals form a bow of white ribbon, which sets off the beautiful floral faces! You glance down the stalks and admire the abundance of vigorous green leaves, all of which are as gracefully veined as if special care had been given to each one by a loving artist. And what do you do next? Very likely you bend down, pull up all this beauty and search the neighborhood for more flowers to pull up. And this is what thousands of flower lovers have done for many years to the most unique and beautiful flowers of our northern states.

Showy Moccasin, the Minnesota State Flower.

The princess of the Moccasin family has several sisters whose beauty is not inferior, but only of a less conspicuous kind. They are

Digitized by Google

the large and the small Yellow Moccasin, the charm of whose golden faces is enhanced by narrow brown streamers of sepals and petals. Then there is the little Pink and White Moccasin of cool wild meadows. Here and there they greet you with a childlike smile as they grow in little clumps half hidden in the grass.

Beard Tongue, or Foxglove—the honey jars of the bumblebees.

Quite different in habit from the little White-Hoods of the meadows is the Noah's Ark with its solitary reddish-purple flowers. Nature has deftly folded the two halves of the flower against each other, then added just a suggestion of crumples and emphasized the veins with a touch of purple. If you would meet the Purple Face, you must seek out sunny spots amongst the tamaracks and cedars, where the old deserted lumber roads lead through northern swamps. Here you will find them scattered single and in twos and threes over the pale green carpet of peat moss. You wonder how they came to be there. It seems as if the nymphs of the forest had planted them.

Everybody loves these floral children of wild meadows and damp woods; but, alas, the story is everywhere the same. Near large cities and populous summer resorts they are becoming extinct through too much admiration. The White Princess goes first, the large Golden Face follows, and the little Bo-Peep Babies close the sad procession. Only the charming Purple Faces remain a little longer here and there on sunlit patches of somber tamarack and cedar swamps. But they remain only because it takes a guide and much exertion to find them.

But not only woodland flowers are threatened by the ruthlessness of a refined civilization, the danger extends even to several denizens of sunny hillsides of bays and lakes, and even to the hardy flowers of our prairies.

Digitized by Google

On dry, sunny slopes grow the large flowered Beard's Tongue, or Wild Foxglove. A few years ago I used to find it in abundance near my home city. Not only a few specimens are left of the large colony, and I never see but a few leaves of these, unless I happen to visit the spot before the school children and Sunday ramblers ravish the hillside.

Each kind of flower has its own story for him who would stop to read and meditate. If any nature lover wishes to see, instead of only to read about it, how insects are adapted to flowers and flowers to insects, he should visit a Foxglove slope. All the roving, blundering bumblebees of the neighborhood flock to the big wreaths of lavender flowers; just like the roving miners flock to a bonanza gold placer. And how the burly insects delve into the pendulous honey jars all through the long June days. The wind may sway the tall stalks or the observer may sit close by, but they work and delve into the flower cups as no miner ever worked and delved for gold, and I have frequently seen one bumblebee visit from twelve to sixteen blossoms a minute.

Blazing Star.

The most charming wild flower of our lakes and old river channels is undoubtedly the White Water Lily. In hundreds and thousands nature has scattered the white stars on the mirrors of the blue summer sky. But you are fortunate if you find a few isolated flowers amongst the floating leaves. You need not look for either flowers or buds after a picnic crowd from the city has been over the ground. I had to visit a lake in the wilds of northern Minnesota to enjoy the Water Lilies in all their pristine beauty and abundance. Fortunately for the life of these floating lilies, their strong, creeping rootstocks are so firmly anchored to the bottom that it would take a crow-bar or dynamite to detach them, and in spite of all our ruthless flower

Digitized by Google

pickers, they continue to send up their slender stalks and floating leaves and flowers year after year.

Shall we save the wild flowers, and how can we do it? If it is worth while to protect game and wild birds, it is certainly worth while to preserve the wild flowers. Comparatively few people can go hunting or care to go hunting, but young and old alike can enjoy the flowers if we will only stop making this fair earth a desert as we pass over it.

The first and most important step is to create the right sentiment towards the beauties and treasures of nature. Schools, clubs, individuals and the press must teach that *"Flowers are most beautiful where they grow, just as birds give the greatest pleasure when they sing on the branches and not when we have them in an unused collection or impaled on a woman's headgear."*

In the neighborhood of cities and summer resorts it should be forbidden to pick certain wild flowers. This protected list should include orchids, water lilies and any other wild flowers in danger of local extermination. The selling and buying of all protected wild flowers should be prohibited, just as the sale of wild game is prohibited in all states that have good game laws. Such a law may seem obnoxious at first thought, but we must remember that we are through conquering the unbounded wilderness. *The time for killing and cutting, burning and destroying has passed; we must now begin to protect and to plant if we would any longer enjoy the beauties and treasures of nature.* This principle is now well recognized for forests, game, fish and song birds, and we must extend it to a certain number of our wild flowers. Owners of summer resorts, if they once understand the subject, are vitally interested in reasonable regulations and protection of our wild flowers. Because the more the natural beauty of a region can be preserved after it has been made accessible, the more attractive it will be to the most desirable class of visitors.

Where visitors are few or flowers very abundant, nothing can be said against picking *a few.* But the roots must never be disturbed. If possible cut the flowers with a sharp knife. Last June I happened upon a place where several children, and also some women, I fear, had picked a harvest of Showy Moccasins. Nearly every root had been torn out of the soft humus, the plants had been torn in two and the roots thrown aside to wilt. The place did not suggest women in white summer dresses, but looked as if a shaggy black bear had fed there, and next June there will be no Moccasin Flowers in that spot.

An Opportunity to Use Wealth for Public Benefit. Near every large city are certain glens, valleys or ravines that are of little or no

Digitized by Google

use for agriculture and pasture. A wealthy and public-spirited citizen could not make better use of his wealth than to buy such tracts and donate them to the city under the condition that their wildness be preserved and the natural beauty not improved out of existence. About the only improvement necessary would be the construction of a few rustic paths and seats. The writer knows of one such glen where there are now growing on the space of about three or four acres

Large Yellow Moccasins—ready for transplanting.

about twenty-five different kinds of trees, shrubs and vines, half a dozen kinds of ferns and about half of all the species of the wild flowers found in the county. A little stream and a bit of Indian history make the place still more interesting. What a boon this little place would be to the city twenty-five or fifty years hence! Will not someone lend a hand and preserve for our children a few unspoiled leaves of God's own library? These leaves are still to be found, but they are becoming more rare every year. How can our children learn to enjoy the flowers, the trees and the birds of the poets if they can

Digitized by Google

never see those of nature? Even our prairie flowers are in danger. At the present time about the only place where residents of St. Paul and Minneapolis can still see a bit of wild prairie with its gorgeous abundance of wild flowers is the Fort Snelling military reservation. Pieces of land from a quarter section to one or more sections should be set aside as wild plant reserves. Unless that is done soon, the coming generations can never know how the country looked in which their fathers made their homes. Twenty-five years from now the right-of-way of the railroads will be the only land where many of our prairie flowers can be found.

Many cities have spent thousands and even millions to establish museums of stuffed birds and animals, and such collections are in every way desirable, but much more desirable and valuable would be a museum of living wild flowers, trees and shrubs in the open air, where nature herself is gardener and curator.

What can be done where the interest of agriculture demands that the wild plants should disappear? When wild land is cleared for farming or is heavily pastured Moccasin flowers and other interesting wild plants will disappear. In that case the desirable plants should be dug up and transplanted to a public park. The writer and a friend dug up one spring about five hundred Yellow Moccasins. A farmer hauled them fifteen miles to town next day and turned them over to the superintendent of the city park, where they were planted and continued to bloom as if nothing had happened to them.

The main thing in transplanting wild flowers is to dig the plants with plenty of roots on them and to keep the roots moist until planted. It is not necessary to furnish exactly the same kind of soil in which the plants grow naturally. A good black soil will do for nearly all kinds. The conditions of light and shade are more vital and should closely resemble the flowers' natural habit.

Last spring I transplanted successfully five kinds of Moccasin flowers and the beautiful red Arethusa into common garden soil, and friends of mine have for years grown Moccasin flowers and several ferns in a small back yard. A few inches of dead leaves is all the protection required for the roots during winter, as that is all nature furnishes.

There is a deadening monotony about the cultivated flowers in most of our cities. From Manhattan to Puget Sound and from St. Louis to Winnipeg the flowers and designs are about the same. If each city had a part of its parks devoted to wild flowers of the region, travelers and tourists would find charming local colors everywhere. Moreover, the great mass of city dwellers, who now know of our wild

Digitized by Google

flowers from books and literature only, might then again see the flowers and feel the inspiration that made our poets and nature writers possible.

What flowers to plant? Any that you like and have room for. They can be grown in pots, in a back yard or in a large park. The early flowers, like Crocus or Pasqueflower, White Hearts and Bloodroots are the small, shy messengers of spring. The Moccasin flowers, Orchids and Roses appear to me as the joyful children of the new summer. Later in the season, nature masses her colors in Blazing Stars, Wild Sunflowers and Goldenrods; and the beautiful tribe of Asters closes the procession, the days wane and the forests begin to turn golden and crimson.

God gave us the wild flowers to enjoy them and not ruthlessly to destroy them. They are an inheritance that we have no right to squander. This generation should not leave a desolation of coarse weeds behind, but should turn over the garden of nature as fair as we received it. We owe to our children an opportunity for a first hand acquaintance with the beauties of nature more than we owe them books and schools and libraries. Nature books without nature can no more satisfy the souls of our children than the dead chaff of wheat can feed their bodies.

My Experience with a Carload of Apples.

F. W. KIMBALL, AUSTIN.

In the fall of 1909 I was away from home all the time. Having a crop of apples on hand and no time to attend to them, I wrote a Minneapolis commission house, asking them to send an agent to look them over and price them, and left it with my wife to attend to. An agent came, looked the orchard over, and would not contract for any but the Wealthy No. 1, but would take and sell the others on commission. Accordingly she signed the contract to that effect. The price for No. 1 Wealthy was to be $2.25 per barrel, delivered at the station in Austin. However, they agreed to send an expert to grade the apples, whose labor was to be free, and we were to board him free.

I happened to be at home when the first carload had been picked and, as it was hot and damp weather, I used haste in getting them off so that they might go onto the market in good shape, and they were duly notified of the shipment. These were shipped in September.

Digitized by Google

As I shipped forty-one barrels of No. 1 Wealthys, I was entitled for those alone under the contract to $92.25 here on the car. On Oct. 21st they rendered me a statement and made remittance of $46.48 for the car, themselves saying they presumed it would not be satisfactory, and it certainly was not. Their first item was for $14 for demurrage, claiming that the car stood on the tracks eighteen and possibly nineteen days in the hot sun. Then came charges for freight, cartage and commission, and these four charges, remember, were in part for their own apples, a very easy way to dispose of their own losses.

I assured them that I was not satisfied, and after quite a lapse of time I was asked how I would settle it. As their statement showed that the car contained 164 barrels, I thought I certainly was entitled to something, and at the same time wanted to close it up without any trouble and offered to settle it for $100 additional. As I was entitled to $92.25 for the apples contracted for, that would give me $54.23 for 123 barrels of very good apples—not enough to pay for the barrels, picking and carting. I thought surely this could not fail to meet with their approval, that they would be glad to rectify such negligence for so small a sum.

I was busy and away most of the time, and over one year having elapsed without any reply, last winter I wrote and reminded them of it. The reply was that the one familiar with the case was away over to the coast, and I would get reply upon his return, but not hearing from them I again wrote in the spring, and got an inquiry as to how much I wanted, and my reply was the same as before, $100. Then came the offer of $50, which I refused and told them that if that was all I would let the "hide go with the carcass." So that is the way it stands at present.

Within a few days after the first carload, a second car was sent of no better apples than the first, and, according to the sale of that carload, which went cheap, I should be entitled to a net price of $134.07 for the 123 barrels that I had on the first car, plus $92.25 for his Wealthy, or $226.32 in all for that car; instead, I am offered $96.48.

I evidently made a mistake that I did not ask $300 instead of $100, for by my low offer they undoubtedly took me for a chump, and I guess they made no mistake.

Digitized by Google

Co-Operation, not Competition, the Key to Horticultural Success.

R. D. UNDERWOOD, SEC. JEWELL NURSERY CO., LAKE CITY.

Jim Hill he says only thirty per cent
Of all the folks on this continent
Is raisin' grub for the rest to eat—
But them that do have the rest of us beat,
And the way to solve high livin's cost
Is to get out and farm it before we're lost.

Si Brown says that a week ago
His apples was makin' a handsome show,
So he picked a barrel, and just for fun,
Took only the finest, and not a one
That was specked or knurly, packed 'em fine,
And sent 'em prepaid by the fast freight line
Up to the city. He hoped for a lot—
Dollar'n' a quarter was what he got.
Down through the orchard, all around,
Apples are lyin' on the ground.
Old Si Brown he looks and swears,
Says they can rot for all he cares.

But mother tells me that when she buys
It costs a lot to make apple pies;
And I kind o' wish that Uncle Jim
Would have some way occur to him
To fix things up 'twixt me and Si
So Si can sell an' I can buy.

That is the way the Denver News recently summed it up, and that is one way of looking at it.

To say that co-operation is the key to horticultural success is making an empirical assertion that might be questioned if we limit its application to the horticultural world. In order that we may not lay ourselves open to that criticism we will extend the general horizon of our subject and make it read thus: "Co-operation, not competition, is the ultimate key to all success."

Having drawn this broad basis for our theory, it will be easier to make a correct application to the horticulturist. I do not overlook the argument in favor of competition, as a means of raising and keeping higher standards of quality, and it is not my purpose to oppose that well-worn doctrine at this time. I am willing to accept the premise that it is correct. When any person is selling you a commodity, and he is, or becomes, careless, slovenly or dishonest about the manner in which he presents it to you, your very natural remedy is to stop patronizing him and go to his competitor. That is the argument in its simplicity. The theory is, that if your former source of supply is unable or unwilling to come up to a reasonable standard of

Digitized by Google

quality and quantity, he will have to go out of business and give way to others who are.

So the necessity of our case brings us to a certain conviction, that while competition may be necessary in our present degree of civilization, it is a necessary *evil* and not a necessary *good*. It is not difficult to realize that the dream of the idealist of a regenerated earth where all men practise the Golden Rule is a possibility. Our growing cynicism, however, has been leading us to a more or less settled conviction that it is more of a probability than a possibility. Hence I believe when we accept the assertion that competition is not only a necessity but a necessary blessing, we are accepting it blindly and not in the light of our own best reason and judgment.

But there are elements entering into this question other than the mere relation between the producer of the thing and its consumer, and, in considering these other elements, no better illustration can be found than in the horticultural field. Let us look.

Beside that co-operation which the Denver poet would like to have arranged between "himself and Si," we find there are several other openings for more co-operation. First, between the grower and his soil; second, between the grower and his plants; third, between the grower and his transportation agency; fourth, between the grower and his fellow growers. There may be others, but these readily occur as being among the most important.

An analysis of the situation shows us that there has been a gradual giving way of the ultra-competitive before the partially co-operative in all of these branches of horticulture. These very meetings of ours here are evidences of this fact, and yet we seem to be a long way from the ultimate solution of the problem. In Minnesota the season of 1911 furnished a bright example of our stupidity. With prices way below a reasonable return upon investment, with thousands of bushels of apples going to waste, there were many people who could not get in connection with "Si," and went apple hungry as a consequence. It happens nearly every time we have a good crop. It is this uncalled-for and unbusinesslike waste of effort and natural resources which we deprecate. What's the use of going on for years and years saying that "it is going to take time to remedy this difficulty"—as it will many other human ills—when we know perfectly well where the trouble is and could remedy it ourselves if we would get together and do it.

Isn't that just the trouble? We know how to do it, we know that it is necessary to get together in order to do it, but we just simply don't get together. We have been hampered by the old worn out mosaic of "every man for himself," and, like the New York congressman who explained the duties of the congressman to his constituents, "We just sit and think." I will not add the rest of what he said.

Digitized by Google

The co-operation between the grower and his fellow growers has seemed to take on a natural evolution upward from force of necessity rather more than from any philosophical or scientific discovery. It is generally so. A kind Providence seems to pick us up by the collar occasionally and plump us down where we ought to be in spite of ourselves. Out on the Pacific coast they began growing fruit a few years ago. Like the framers of the American constitution, they evidently made up their minds to throw all antiquated precedents overboard and start in right from the foundation. At any rate, the combination of soil, climate and good sense have given us standards of excellence in quality and in methods of handling that the older fruit producing sections will have to copy or go down before.

Yet there are those in the western fruit districts who object that the fruit combine is a cold-blooded, mercenary proposition, and that it is as far from the ideal as ever. I think, however, investigation will generally prove that those who make this objection are persons who have either been disappointed that they did not get in on the ground floor when apples were a bonanza, or people who, for some reason or other, failed to meet the general standards required by the fruit growers' unions.

Co-operation between the grower and the soil and the tree is not so startling a proposition today as it might have been a few years back. It is a scientific game from beginning to end. But there is added to it a higher kind of science, which has to do more with the innate qualities of the man than with any hand-made rules. A successful horseman and dairyman—any man who succeeds with domestic animals—is generally one who finds it really difficult to tell just why he succeeds. There is a certain element of sympathy between him and his subjects which manifests itself in the successful outcome of his work. The idea is forcing itself upon us more as time goes on that this same element exists in the horticultural and agricultural fields.

If I were to say that this co-operation I speak of consists of a sympathetic relation between the horticulturist and the tree, or the soil upon which he produces it, some of you would, I imagine, treat the matter very lightly. Still that is, I assert, just what we are coming to, through our horticultural schools and colleges. The only trouble is that even there nature is regarded as something wholly outside of human life, something to be used, driven, managed on the one hand or to become the victims of on the other. It has been the poets and philosophers who have kept the light of knowledge from entirely going out many times during the world's history, and today we have the innate feeling that it is the color and imagery and warmth of the painter and poet that opens our minds to the real pleasure of living in harmony with natural law. It is they who have reawakened in us the joy of a life in the open, companioned with the clouds, the hills and streams, the birds and trees and flowers. As we go on and develop and rediscover the ancient truth that we are *in* the realm of nature—that all the forces of the natural world are inextricably woven into our very being, it will dawn on us with amazing simplicity that we are not mere idle observers, nor even masters of nature, except in so far

Digitized by Google

as we can recognize her upward tending or evolutionary laws, and work with them for their greater efficacy. We are discovering that we too are part of the plot!

Your future horticulturist will know all about the essential chemical requirements of soils for the particular crop he is producing. He will not be groping around in the dark in this direction; *he will know.* If our predecessors of a hundred years ago could look forward and see him, they would regard him as a magician, and so he will be by reason of natural development. He will have started his path of knowledge with the theosophical fact that he is not dealing with mere dead, inanimate matter. History and observation will have shown him that trees, no less than animals and men, have a kind of mind, a consciousness, likes and dislikes, and so on, which must be understood by the successful grower.

The soil itself, instead of being the "senseless clod," has become a scene of light and action. Every year as the discoveries of radium and radio-activity have been pushed forward, we are being brought nearer the universal truth that everything is alive—except perhaps a mind in the stupor of ignorance.

Then would there be anything unreasonable in extending this idea of co-operation, of harmony, of brotherhood, if you please, to the point where as self-appointed administrators of the horticultural world we should regard ourselves as agents in the great human scheme whereby our fellow men who toil in the smoke and squalor of the city and the mine may partake at least of the saving fruits of the sunshine? Is it unreasonable to suppose that the horticulturist who raises the estimate of his labor to that exalted standard would not acquire greater knowledge of the natural forces with which he deals and consequently greater success in his effort? In the Book of the Golden Precepts, one of the great scriptures of ancient India, it is written: "Then will Nature regard thee as one of her creators and make obeisance."

Now I hope it was not expected that I would offer any panacea or even a rule for arriving at that real co-operation, which seems to be so necessary and desirable a feature of successful horticulture. The limits imposed upon this paper will not permit. I am free to say that like most other people who take the liberty of criticizing, it would give me pleasure to go on and work out the theory as it appeals to me, but I will not do that. There are those older, wiser and better able to give such definite advice. All I have endeavored to do is to offer a few suggestions, the prerogative of every "wise guy."

Certainly we have just now enough competition in our particular field of activity to give us all we want of that good old fire-blighted argument. We like our vocation, it is a good, healthy job, and we are generally satisfied if we make a comfortable living. That part of it is all right. That is all a man needs. But in the face of our labors we don't seem to be reaching the people who want our products. It is probably their fault just as much as it is ours, but it looks to me like a ground hog case for us to discover some means of curing it and not to wait for them to do so.

Digitized by Google

Award of Premiums, Annual Meeting, 1911, Minnesota State Horticultural Society.

GRAPES.

Wilder	F. A. Averill, Excelsior	First	$0.75
Worden	" "	Second	.50
Wyoming Red	" "	Second	.50
Delaware	" "	Second	.50
Moore's Early	" "	Second	.50
Duchess	" "	First	.75
Eldorado	" "	Second	.50
Herbert	" "	Second	.50
Lindley	" "	First	.75
Lady	" "	Second	.50
Massasoit	" "	First	.75
Moore's Diamond	" "	Second	.50
Empire State	P. H. Perry, Excelsior	Second	.50
Pocklington	" "	Second	.50
Agawam	F. A. Averill, Excelsior	First	.75
Aminia	" "	Second	.50
Brighton	" "	Second	.50
Cottage	" "	First	.75
Campbell's Early	P. H. Perry, Excelsior	First	.75
Janesville	" "	First	.75
Delaware	" "	First	.75
Herbert (R. 44)	" "	First	.75
Concord	" "	First	.75
Worden	" "	First	.75
Niagara	" "	First	.75
Woodruff Red	" "	First	.75

GUST JOHNSON, Judge.

COLLECTIONS OF APPLES.

		Per Cent.	
Collection	W. J. Tingley, Forest Lake	65	$1.64
Collection	P. H. Perry, Excelsior	75	2.25
Collection	Carl Steller, Excelsior	60	1.79
Collection	Geo. W. Strand, Taylors Falls	75	2.25
Collection	Fred Zuercher, Excelsior	75	2.25
Collection	W. S. Widmoyer, Dresbach	50	1.49
Collection	J. A. Howard, Hammond	90	2.69
Collection	Mrs. S. R. Spates, Wayzata	55	1.62
Collection	F. A. Averill, Excelsior	55	1.62
Collection	Henry Husser, Minneiska	80	2.40

JNO. P. ANDREWS, Judge.

APPLES—SINGLE PLATES.

Ben Davis	F. I. Harris, LaCrescent	First	$0.50
McMahon	" "	Third	.30
Golden Russet	" "	First	.50
Wealthy	Jewell Nursery Co., Lake City	Second	.40
Malinda	" "	Second	.40
N. W. Greening	E. B. Russell, Excelsior	Third	.30
Jewell's Winter	Mrs. S. R. Spates, Wayzata	Second	.40
Sugar Loaf	A. N. Bates, Excelsior	First	.50
Newell's Winter	W. J. Tingley, Withrow	Second	.40
Nelson	" "	Second	.40
Yahnke	" "	First	.50
Walbridge	" "	First	.50
Malinda	Henry Husser, Minneiska	First	.50
Fameuse	" "	First	.50
Haas	" "	Second	.40
Okabena	C. R. Rogers, Mound	First	.50
Ben Davis	Henry Husser, Minneiska	Second	.40
Utter	" "	Third	.30
Peerless	F. A. Averill, Excelsior	Third	.30
Wolf River	J. A. Howard, Hammond	First	.50
Jewell's Winter	" "	First	.50
Borovinca	Mrs. S. R. Spates, Wayzata	Second	.40
Peter	" "	Third	.30
Hibernal	" "	Third	.30
Iowa Beauty	" "	Third	.30
University	" "	Third	.30
Yellow Transparent	J. A. Howard, Hammond	First	.50
Anisim	" "	First	.50
Charlamoff	" "	First	.50
Malinda	" "	Third	.30
N. W. Greening	" "	Second	.40
Peter	" "	Second	.40
Wealthy	" "	Third	.30
Plumb Cider	" "	Third	.30
Red Wine	" "	Second	.40

Digitized by Google

Red Astrachan	"	"	First	.50
Rollin's Prolific	"	"	First	.50
St. Lawrence	"	"	First	.50
Salome	"	"	First	.50
Tetofsky	"	"	Second	.40
Utter	"	"	First	.50
White Pigeon	"	"	First	.50
Yellow Sweet	"	"	Second	.40
Giant Swaar	"	"	First	.50
Gilbert	"	"	First	.50
Golden Russet	"	"	Second	.40
Grundy	"	"	First	.50
Haas	"	"	Third	.30
Hutchins	"	"	Second	.40
Iowa Beauty	"	"	First	.50
Jewell's Sweet	"	"	Second	.40
Judson	"	"	First	.50
Lords L.	"	"	Third	.30
Milwaukee	"	"	Third	.30
Nelson	"	"	First	.50
Newell's	"	"	First	.50
Repka Malenka	P. Clausen, Albert Lea		First	.50
Yahnke	"	"	Third	.30
Okabena	"	"	Second	.40
Anis	J. A. Howard, Hammond		First	.50
Brett	"	"	Second	.40
Borovinca	"	"	Third	.30
Christmas	"	"	Second	.40
Evelyn	"	"	Third	.30
Fameuse	"	"	Second	.40
Gideon	"	"	First	.50
Longfield	Fred Zuercher, Excelsior		Second	.40
Antonovka	"	"	Third	.30
Walbridge	G. A. Anderson, Renville		Second	.40
Fameuse	"	"	Third	.30
Peerless	Geo. W. Strand, Taylors Falls		First	.50
Haas	N. D. MacGillivery, Hopkins		First	.50
Duchess	"	"	First	.50
Charlamoff	"	"	Third	.30
Lowland Raspberry	Geo. W. Strand, Taylors Falls		First	.50
Red Wine	"	"	First	.50
Anisim	"	"	Second	.40
Hibernal	"	"	First	.50
Peter	"	"	First	.50
Christmas	"	"	First	.50
Milwaukee	"	"	First	.50
Peerless	Carl Steller, Excelsior		Second	.40
Wealthy	"	"	First	.50
Wolf River	"	"	Third	.30
Ben Davis	Geo. W. Strand, Taylors Falls		Third	.30
Plumb's Cider	"	"	First	.50
Walbridge	"	"	First	.50
Evelyn	A. B. Lyman, Excelsior		First	.50
Evelyn	Carl Steller, Excelsior		Second	.40
Plumb's Cider	"	"	First	.50
Talman Sweet	"	"	First	.50
Antonovka	P. H. Perry, Excelsior		Second	.40
Salome	"	"	Second	.40
Wolf River	"	"	Third	.30
Jewell's Winter	"	"	Third	.30
Iowa Beauty	"	"	First	.50
N. W. Greening	S. H. Kenney, Waterville		Third	.30
Patten's Greening	P. H. Perry, Excelsior		Second	.40
Yellow Transparent	"	"	Second	.40
McMahon	"	"	Second	.40
Hutchins	W. J. Tingley, Forest Lake		First	.50
University	"	"	Second	.40
Haas	"	"	First	.50
Superb	"	"	First	.50
Yellow Sweet	"	"	First	.50
Eastman	"	"	First	.50
Milwaukee	"	"	Second	.40
Lords L.	"	"	First	.50
Anisim	J. F. Benjamin, Hutchinson		Third	.30
Longfield	"	"	Third	.30
Duchess	W. J. Tingley, Forest Lake		Second	.40
Charlamoff	"	"	Second	.40
Patten's Greening	"	"	First	.50
Hibernal	Thos. Redpath, Wayzata		Second	.40
McMahon	"	"	First	.50
Okabena	"	"	Third	.30
Longfield	D. C. Webster, LaCrescent		Second	.40
N. W. Greening	"	"	First	.50

Digitized by Google

Antonovka	Thos. Redpath,	Wayzata	First	.50
Brett	"	"	First	.50
Borovinca	"	"	First	.50
Jewell's Sweet	"	"	First	.50
Lord's L.	"	"	Second	.40
Utter	"	"	Third	.30
University	"	"	First	.50
Yahnke	"	"	Second	.40
Duchess	"	"	Third	.30

JNO. P. ANDREWS, Judge.

COLLECTIONS APPLES—TOP-WORKED.

		Per Cent.	
Collection	P. Clausen, Albert Lea	75	$2.32
Collection	O. W. Moore, Spring Valley	60	1.86
Collection	E. G. E. Reel, Excelsior	75	2.32
Collection	W. J. Tingley, Forest Lake	90	2.80
Collection	S. H. Kenney, Waterville	40	1.25
Collection	Geo. W. Strand, Taylors Falls	75	2.32
Collection	J. A. Howard, Hammond	95	2.95
Collection	J. Flagstad & Sons, Sacred Heart	50	1.56
Collection	A. J. Philips, West Salem, Wis.	95	2.95
Collection	W. S. Widmoyer, Dresbach	40	1.25
Collection	Jewell Nursery Co., Lake City	50	1.56

F. I. HARRIS, Judge.

PECKS OF APPLES.

			Per Cent.	
Malinda	Geo. W. Strand, Taylors Falls		84	$0.68
Plumb's Cider	"	"	80	.61
Patten's Greening	"	"	65	.50
Milwaukee	"	"	86	.66
N. W. Greening	"	"	88	.68
Wealthy	"	"	75	.58
Seedling	G. A. Anderson, Renville		50	.39
Wealthy	Fred Zuercher, Excelsior		80	.61
Patten's Greening	"	"	80	.61
Wealthy	J. A. Howard, Hammond		90	.69
Patten's Greening	"	"	75	.58
Wolf River	"	"	72	.55
Peter	"	"	80	.61
N. W. Greening	"	"	90	.69
Anisim	F. A. Averill, Excelsior		50	.39
Duchess	"	"	65	.50
Hibernal	"	"	60	.45
Longfield	"	"	75	.58
N. W. Greening	"	"	55	.42
Pattens Greening	"	"	40	.31
Peerless	"	"	40	.31
Wealthy	"	"	70	.54
McIntosh Red	J. Flagstad & Sons, Sacred Heart		76	.59
Unknown	J. J. Dobbin, Excelsior		90	.69
Malinda	Emil Sahler, Waseca		85	.65
Ben Davis	"	"	72	.55
Sugar Loaf	A. N. Bates, Excelsior		80	.61
Malinda	"	"	78	.60
Duchess	J. A. Howard, Hammond		68	.52
Utter	"	"	80	.61
Wealthy	Jewell Nursery Co., Lake City		98	.76
N. W. Greening	"	"	94	.72
Malinda	"	"	88	.68
Jonathan	"	"	80	.61
Wealthy	Carl Steller, Excelsior		90	.69
Longfield	D. C. Webster, LaCrescent		78	.60
N. W. Greening	"	"	90	.69
Patten's Greening	P. H. Perry, Excelsior		70	.54
N. W. Greening	"	"	85	.65
Evelyn	A. B. Lyman, Excelsior		76	.59
Patten's Greening	Carl Steller, Excelsior		68	.52
Duchess	"	"	70	.54
Ben Davis	Geo. W. Strand, Taylors Falls		85	.65

F. J. COWLES, Judge.

BUSHEL BOXES OF APPLES.

			Per Cent.	
Wealthy	Fred Zuercher, Excelsior		68	$0.96
Wealthy	Jas. F. Harrison, Excelsior		49½	.69
Wealthy	J. A. Howard, Hammond		101½	1.40
Patten's Greening	"	"	73	1.02
Wolf River	"	"	78	1.09
Jewell's Winter	"	"	74	1.03
N. W. Greening	"	"	76½	1.07
Peter	"	"	90½	1.26

Digitized by Google

Hibernal	F. A. Averill, Excelsior	52½		.73
Patten's Greening	" "	51½		.71
Peter	" "	58½		.82
Wealthy	" "	66		.92
McIntosh Red	J. Flagstad & Sons, Sacred Heart	76		1.06
Wealthy	J. J. Dobbin, Excelsior	87½		1.22
Walbridge	H. Vollenweider, LaCrescent	77		1.08
Seedling	F. I. Harris, LaCrescent	73½		1.10
Seek-no-Further	" "	59		.83
Wealthy	Jewell Nursery Co., Lake City	91		1.37
Wealthy	Thos. Redpath, Wayzata	81½		1.13
N. W. Greening	" "	85½		1.19
Scott's Winter	D. C. Webster, LaCrescent	75½		1.05
N. W. Greening	" "	86½		1.21
Unknown	A. Brackett, Excelsior	86		1.20
Wealthy	W. J. Tingley, Forest Lake	60½		.85
University	" "	85½		1.19
Patten's Greening	P. H. Perry, Excelsior	85½		1.19
Seedling	" "	79		1.11
Patten's Greening	Geo. W. Strand, Taylors Falls	64½		.91
Milwaukee	" "	57		.80

A. R. KOHLER, Judge.

SEEDLING APPLES.

		Per Cent.	
Early Winter	Jos. Wanlass, Mindora, Wis.	85	$2.08
Early Winter	" "	70	1.73
Late Winter	" "	85	2.84
Late Winter	" "	85	2.84
Late Winter	Thos. Redpath, Wayzata	80	2.68
Early Winter	A. Brackett, Excelsior	70	1.73
Early Winter No. 20-a	T. E. Perkins, Red Wing	65	1.53
Early Winter No. 5	" "	80	1.98
Late Winter No. 72	" "	95	3.15
Late Winter No. 54	" "	85	2.84
Late Winter No. 108	" "	87	2.90
Late Winter No. 32	" "	60	2.03
Late Winter	S. H. Kenney, Waterville	70	2.35
Late Winter	P. H. Perry, Excelsior	60	2.03
Early Winter	" "	68	1.69
Late Winter	Mrs. M. A. Knowles, Excelsior	70	2.35
Late (sweet)	John M. Broome, Mankato	75	2.51
Early Winter	H. H. Pond, Minneapolis	70	1.73
Early Winter	W. S. Widmoyer, Dresbach	70	1.73
Late Winter	" "	60	2.03
Late Winter	P. Clausen, Albert Lea	60	2.03
Early Winter No. 1	J. A. Howard, Hammond	60	1.40
Early Winter No. 2	" "	65	1.53
Early Winter No. 4	" "	75	1.86
Early Winter No. 6	" "	80	1.98
Early Winter No. 8	" "	80	1.98
Late Winter No. 3	" "	70	2.35
Late Winter No. 5	" "	60	2.03
Early Winter	G. F. Kerns, Imogen	80	1.98
Late Winter No. 2	Christian Fink, Waconia	60	2.03
Early Winter No. 3	" "	80	1.98
Early Winter No. 4	" "	80	1.98
Early Winter No. 6	" "	87	2.15
Late Winter	W. S. Widmoyer, Dresbach	90	3.00
Late Winter	Michael Oleson, Montevideo	60	2.03
Early Winter	" "	65	1.53
Late Winter	" "	65	2.19
Early, Hake's Fav. Sdlg.	Geo. J. Kellogg, Lake Mills, Wis.	68	1.70
Late, Aldrich Seedling	" "	65	2.19
Early Winter	Martin Stoa, Albert Lea	65	1.53
Early Winter	Henry Gerdsen, Victoria	75	1.86
Early Winter	" "	90	2.22
Late Winter	" "	65	2.19
Late Winter	Jul Zimmerman, Minneiska	60	2.03
Late Winter	Henry Husser, Minneiska	60	2.03
Late Winter	" "	75	2.51
Late Winter No. 1	Christian Fink, Waconia	85	2.84

CLARENCE WEDGE, WYMAN ELLIOT, CHAS. HARALSON, Judges.

NUTS.

Butternuts	D. T. Wheaton	Second	$0.75
Black Walnuts	Preston McCulley, Maple Plain	Fourth	.25
Butternuts	" "	Fourth	.25
Walnuts	Henry Husser, Minneiska	First	1.00
Butternuts	" "	First	1.00
Hickory Nuts	" "	Second	.75
Hickory Nuts	F. I. Harris, LaCrescent	First	1.00
Walnuts	" "	Second	.75
Butternuts	" "	Third	.50
Black Walnuts	Chas. E. Chrisman, Ortonville	Third	.50

A. B. LYMAN, Judge.

Digitized by Google

GARDEN HELPS

CONDUCTED BY

The Minnesota Garden Flower Society

(Formerly The Minnesota State Rose Society)

Edited by MRS. E. W. GOULD, Sec'y, 2644 Humboldt Avenue So., Minneapolis.

GREETING:

This page has been most generously given us by the Horticultural Society. Our aim will be to make it, in truth, a real garden help to our readers. Seasonable articles and suggestions will be a feature of it, and questions pertaining to the growing and culture of flowers will be answered.

Notices of our meetings will be found here. It is proposed to hold these meetings more frequently and to make them as practical and helpful as possible. The next meeting of this society will be held in the Directors' Room of the Minneapolis Public Library, January 17th, at 2:30 p. m.

Program: 1.—Flower Culture from Seeds and Bulbs. 2.—Question Box. You can't afford to miss this meeting. Each member may bring three guests. Meeting of Executive Committee will be held at the same place and date at 2:00 o'clock.

The early snow caught many with the perennials uncovered. These are all right as long as the snow covers them, but as it melts cover with straw, wild hay or corn stalks, it being too late to use leaves.

As a rule, plants that die down to the ground can be covered with manure put on *late* and removed *early* in the spring; but do not put it on plants with more or less evergreen crowns, such as foxgloves, hollyhocks and canterbury bells. It may be put around them, but must not be placed over their crowns, being too heavy and warm, and will rot them. It is a good plan to cover these first with a layer of brush or corn stalks (to keep the weight of the covering from crushing them and to let in the air), then with straw, hay or leaves over this—but not too much. We cover to prevent the plants from alternate thawing and freezing, not to keep out Jack Frost.

BLACK WALNUTS AT BIG STONE LAKE.—Mr. Chas. E. Chrisman, an old member, at Ortonville, writes me that he has an acre of black walnuts in bearing, grown from seed that came from Iowa nine years ago. He gave away all the seed that ripened this year. Others of our society who have hardy black walnuts would do a good service to the state by scattering the seed they bear far and wide for planting as far north at least as they can be made to succeed. The secretary will take pleasure in advertising the location of such growers, and any seed so grown for distribution, either gratuitously or for reasonable compensation.

Digitized by Google

SECRETARY'S CORNER

GIDEON MEMORIAL AWARDS:—The annual contest at the State Agricultural School for the prizes offered from the Gideon Memorial Fund resulted this year as follows: First prize of $12.00—G. P. Warber; second prize of $8.00—R. M. Peterson; third prize of $5.00—A. J. Lashbrook.

ANNUAL MEETING OF THE WISCONSIN SOCIETY.—The Wisconsin State Horticultural Society is to hold its annual meeting in Madison Jan. 9-10-11. Prof. F. L. Washburn, State Entomologist, is to represent our society on that occasion, and a report of the meeting may be looked for from him in the February number.

ANNUAL MEETING, SOUTHERN MINNESOTA SOCIETY.—The next annual meeting of the Southern Minnesota Horticultural Society, one of the strongest auxiliaries connected with the state society, will be held at Spring Valley, Minn., Jan. 17th to 19th. Members of the state society in that part of the state should not fail to attend this important gathering. There will, as always on such occasions, be an opportunity for securing much practical information and an inspiration as well.

RABBITS IN THE ORCHARD.—If rabbits are numerous in spite of trapping and killing, it will be a good plan to keep the tops above the snow covered with fresh, concentrated lime-sulphur wash. Poisoned corn may be used for the rabbits with perfect safety. Soak the kernels in a strychnine solution, and place them out about the trees, taking them up in the morning before stock or poultry can get to them. The rabbits will die nearby, and the bodies can be collected and buried.—K. A. Kirkpatrick.

DEATH OF R. M. PROBSTFIELD.—This earnest and valued old time member of our society died at his home in Moorhead on Sept. 11th, last. Notice of his decease came to this office only recently. Mr. Probstfield first became a member of the society in 1880, but his name did not appear upon the roll again until recent years. For a number of years past he has been a regular attendant at the meetings, taking part in the discussions, and in every way possible aiding in the work of the society. He carried on a considerable amount of experimental work at his home in the Red River Valley, which we understand his son, A. P. Probstfield, purposes to continue.

ABOUT ENCLOSED BILL.—If your number of the January Horticulturist contains a bill reading "Dr. to subscription for the Minnesota Horticulturist for 1912" please understand this to mean that your membership fee in the Horticultural Society for 1912 has not been paid. We should much prefer to have the bill read "Dr. to membership fee for 1912," but the post office department does not allow us to put a bill reading in this way into the magazine. It must read "Dr. to subscription," which in our case of course is misleading, as we take no subscriptions for the Minnesota Horticulturist, it being sent only to members. Upon receipt of one of these bills, please remit membership fee at your early convenience, and a number will be given you to place upon the membership ticket that was sent you unnumbered some time ago.

Digitized by Google

Digitized by Google

EXHIBIT OF MINNESOTA FRUIT MADE AT THE LAND SHOW IN ST. PAUL DEC. 11 TO 24, 1911.
THOS. REDPATH, FRONT VIEW; F. O. HARRIS, SIDE VIEW.

Digitized by Google

☞After reading this magazine, will you please pass it along to some friend who will appreciate it and whom you may perhaps interest to become a member of the society—at least he should derive benefit from its reading. By distributing in this way the twelve magazines received during the year 1911, at the beginning of the next year, upon renewing your membership in the society you will be entitled to receive postpaid a cloth bound volume containing all the magazines for 1911 and much other interesting matter, with a full index of all its contents, entitled "Trees, Fruits and Flowers of Minnesota," a handsome book for your library and invaluable for reference.

THE MINNESOTA HORTICULTURIST

Vol. 40. FEBRUARY, 1912. No. 2.

Minnesota Fruit Exhibit at the St. Paul Land Show.

It is of course generally known that the exhibit of Minnesota products at the Land Show, held in St. Paul, in the middle of December, took first prize as an exhibit of products in competition with similar exhibits from the states west of us, even as far as the Pacific Coast. It may not be known, however, to what an extent the fruit exhibit from this state contributed to this end. There were many fine fruit exhibits in the hall from western states, Montana, Washington, etc., and exhibits of fruit were also made from the well known fruit growing valleys of those states, so that Minnesota had to compete with the best of the good fruit growing regions of the country.

A small amount of fruit had been collected for the Minnesota exhibit, but up to the time of the annual meeting of this society, the first week in December, nothing like an amount of fruit of the quality desired for this purpose had been gotten together. A number of the members of the commission having the Minnesota exhibit in charge made an appeal before the annual meeting on the afternoon of Thursday, Dec. 7th, urging the society to transfer the fine fruit exhibit then on exhibition at the meeting to the Land Show, and appealing to the interest the society must have in a successful fruit show at that time.

As it happened, the fruit on exhibition, with the exception of that shown in pecks of apples, was not the property of the society, but belonged to the various exhibitors. They were appealed to and almost without an exception acquiesced in the request that this fruit be donated to the Land Show, a few of the larger exhibitors having ten bushel boxes or more consenting to take a nominal price for their fruit to help out the exhibit. The result of this generous movement on the part of our members was that after sorting out the inferior fruit and repacking we sent down to St. Paul for this exhibit nearly three times

Digitized by Google

as much fruit as the space allotted for the purpose could accommodate.

A large sign, suitable to go with so fine an exhibit as this, had been prepared, but we were unable to use it on account of the limitations of space. The fruit exhibits made, however, contained fruit on an average as good in quality and appearance, and in many cases in quantity, as that shown by other western states. The exhibit earned for Minnesota many compliments and was certainly a great benefit in connection with this affair in advertising the fruit growing possibilities of the state.

View of Minnesota Fruit Exhibit at St. Paul Land Show.

Mr. Thos. Redpath assumed the superintendency and care of this exhibit, assisted by Mr. F. I. Harris, and remained with it throughout the two weeks in which it was kept up. We regret not being able to publish a list of those who contributed to this exhibit, and especially as the number who did so is a large one we would not care to publish a partial list. If a full list can be secured later we shall try and find place for it in our monthly.

The engravings accompanying this will give the reader some idea of the extent and character of the display.

A. W. LATHAM, Secretary.

Digitized by Google

Everbearing Strawberries.

GEO. J. KELLOGG, NURSERYMAN, LAKE MILLS, WIS.

Away back in our youth we had the Bush Alpine, which was too small and unproductive. In 1860 Bro. Gardener planted seeds of this variety in Iowa; later came the French varieties, bearing fruit the first year from seed. I fooled away some money on this seed, that bore a tiny berry the second year.

Nothing very promising in everbearing strawberries was brought out until Hon. Sam'l Cooper discovered a sport among his Bismark; this was in 1898. This fruit attracted a good deal of attention at the Buffalo Exposition and was named Pan-American. This is a vigorous plant, perfect in blossom, a good bearer, but makes few plants. Mr. Cooper originated the Autumn, a seedling of Pan-American. This is a pistillate, and it bears too much; I have counted 300 berries on a single hill, and the first year I planted this I took a layer that had fifty-three berries on it to the fair. Now there are many seedlings of Pan-American that are promising; I added to my list last spring Francis, Americus, Iowa, Superb, Productive and Meteor. These are all perfect in blossom except Productive and good plant makers; they have grown from fifteen to forty plants each this dry season.

L. J. Farmer would add to this list Teddy Roosevelt and Rockhill No. 16; he writes me August 18th: "The everbearings are doing fine. Last year I planted out 500 plants in May, and we picked nearly 400 quarts the following August, September and October, which were fine, luscious berries and sold for from 40 to 50 cents per quart, netting us at the rate of over $2,000 per acre."

M. Crawford, while visiting my garden last year, said his folks were selling the everbearing strawberries at 40 cents a quart in September.

Our Bro. Gardener seems to be overdoing the seedling business. He paid $200 for strawberry seed. In 1910 he had eighty thousand varieties, and he writes me November 4th, 1911, that he has "one little patch of 44,000 seedlings from which he is selecting the best, which will astonish the natives." He seems to be on the road to success, and we hope his 549 plants of one variety will be all he hopes for. But while he is experimenting we may as well work with the best proven kinds we have; and here is L. J. Farmer's "list for profit:" 1st, Francis; 2nd, Americus; 3rd, Productive; 4th, Rockhill No. 16. If these will produce at the rate of over $2,000 per acre the season of planting we ought to be satisfied.

Digitized by Google

October 26th I picked a handful of six kinds and herewith is the picture they made, showing full bloom to ripe and mature fruit that measured three inches. The past season everything suffered with the heat and drouth. Plants at $2.00 a dozen seems high, but grow your own plants! A dollar a plant will pay when you can grow forty in one season. Don't fool away your money for cigars, buy something that will do yourself and family some good.

Mr. H. Rockhill, of Iowa, writes me November 27, 1911, that after eight years experimenting with 4,000 plants, all from hand hybridized seeds, he puts his No. 16 at the head of the list. He says: "Heretofore I have put Americus first. All of the free running kinds will be much more productive if kept in hills and the runners clipped a couple of times; then they will pile up the berries. No. 16 makes more plants than Americus."

E. H. Reihl, of Illinois, says Americus and Francis, originating with Mr. Rockhill, are the best and produce in quantity from May till winter.

Mr. Kellogg (Wis.): It was not my purpose to have this paper discussed until my friend Gardner, from Iowa, could be here. He is a red hot enthusiast on this question. A man who will raise forty thousand varieties must know something about it.

The Secretary: Here he is coming now. Look out for him! (Laughter.)

Mr. Benjamin: Now, Mr. Gardner, tell us about those forty thousand varieties.

Mr. Kellogg: What are the best kind of plants in the ever-bearing varieties?

Mr. C. F. Gardner (Iowa): I left home at two o'clock this morning, but our train was two hours late, and I have not been to breakfast. I wanted to hear Mr. Kellogg's paper, but it seems he has just finished reading it. In regard to this question that was just asked, I want to say that there is no man on earth who could answer it. There are a great many good kinds among them, and it is going to take time to judge which is the best. There are two kinds that Mr. Cooper has produced, among some of his later productions, and I think I have both of them. There are a good many other good kinds, and among them is the Americus. I told you about the five hundred I had last year, but I threw out four hundred this spring. I threw nearly all of those out, and that leaves me four for further test. This season we had an immense lot of seedlings. Some of you would not believe it unless you came down there and saw them. If there is anybody here who is particularly interested, I would be mighty glad to have them come down and see what we have got. I want you to understand that we have some strawberry plants down there in this line of work and lots of them.

Mr. Kellogg: I told them you had forty thousand.

Digitized by Google

Mr. Gardner: Well, if it was anyone else I might dispute that. (Laughter.) Now, starting with the old type of bush Alpine, there have been a great many good kinds, and coming right down to the time Mr. Cooper found the Pan American,—and you know he thought the Pan American was his best to ever-bear, and he thought that was a sport growing from a runner of the Bismarck. I thought I had discovered something of that sort, but I could not find the connection with the runner, there was nothing between, and I think I stated in my paper last year that I thought it was a sport, but I could not find any connection with the other plant. I thought it was a sport, and so I called it a seedling. If I had been satisfied to pass it on and

Everbearing Strawberry in fruiting. Five varieties in bearing with Mr Kellogg, Oct. 28, 1911.

let it alone and say it was a sport, it would be a different strawberry. After I described my plant and told you people about it last year, Mr. Cooper read what I said about it, and he wrote me and said, when I bought my last batch of plants his men encroached too far over on his favorite seedlings and happened to get some good ones. (Laughter.) It is possible that there are others that originated in the same way, and maybe they will be the same kind of sports as mine. There is so much in this matter of ever-bearing strawberries that I do not want to take the time to speak of it at present, but if there is any time in the future during the course of the meeting and I can say anything on this subject, I would be glad to have the opportunity.

Dr. H. M. Speechley (Manitoba): I have no experience as an expert in this matter, but it might be of interest to tell the meeting

Digitized by Google

that strawberries are being grown very successfully after Mr. Kellogg's example by Mr. Buchanan, of Winnipeg. Mr. Buchanan has been very successful with strawberries for a good many years. There is also a retired farmer in the vicinity who is successful in these same lines. They followed closely the method laid down by Mr. Kellogg.

Mr. E. P. Miller: Do you need to plant anything with them?

Mr. Kellogg: The plants are perfect bloomers.

Mr. Gardner: About half of pistillate and half of staminate.

Horticultural Notes.

E. A. SMITH, VICE PRES., JEWELL NURSERY CO., LAKE CITY.

Our horticultural slogan is, "more hardiness and better quality."

The marketing of fruit is no less important than the growing of it. The orchardist who waits until his apples are ripe before he orders his barrels or boxes for packing will never make a success of growing fruit. A campaign of education should be started which should be carried on through the farm papers of the state, and the farmers' institutes, as to the best methods of packing and marketing our apple crop.

If horticulture were more of a fad, it is possible that it might be introduced more generally in the curriculum of our schools, but as it is only an important study it receives but little, if any, attention. What is the matter with our schools?

Beta Grape.—The Beta grape has more than met the expectations of those interested in its propagation. Clusters have been grown which weighed nearly one pound. The vine is hardy. The State Fruit-Breeding Farm reports about three hundred new varieties of grapes, equal or superior to the Beta.

Prof. Hansen's Fruits.—The following fruits originated by Prof. N. E. Hanson, known as the Sapa, Opata, Sansota and Cheresota, have with us proven hardy up to date. The fruits are delicious, and we believe they are a valuable acquisition to the fruits of the Northwest.

Delicious Apple.—The Delicious apple holds the highest quality mark of any apple, according to the report of judges at important fruit exhibits. For two years, with us, this tree has wintered well and made a splendid growth. The claim is made, and so far as we know it is correct, that it is about as hardy as the Wealthy. It is well worth testing in different orchards of the state.

Digitized by Google

Sweet Apples.—Every orchard should have some sweet apple trees. For eating out of hand, baking or preserving, to people who like this kind of fruit, there is nothing better. There are a few sweet apple trees sufficiently hardy to withstand our climate.

Whitney Crab.—This fruit is growing more in popular favor. When picked a little on the green side it ships fairly well. It is one of the best early eating apples we have, and for canning purposes is par excellence.

McIntosh Apple.—I have in my garden a McIntosh apple tree set out three years ago. It was three years old when set out. It is now 2½ inches in diameter, perfectly healthy, has made a splendid growth in every way. I suggest that this variety be planted at different trial stations.

Salome Apple.—We have tried for three years to propagate this tree successfully, but each year it freezes back. We cannot recommend it on this account and do not believe it is sufficiently hardy to recommend for general planting in Minnesota.

Miscellaneous.—It would be of interest to know what is the average cost of growing a bushel of apples in Minnesota, said cost to include taxes, interest on the investment and all other expenses relating to care of the orchard and marketing of the fruit. I would suggest that the Minnesota Horticultural Society endeavor to secure this information. It would be valuable for reference.

Last fall I noticed on one of the fruit stands in Minneapolis a sign which read "Wealthy Apples for Sale." I turned to look at them, but they were not the Wealthy. I did not know what the variety was —it was new to me. There should be a bill presented to the Legislature, having the backing of the Horticultural Society of this state, making it a misdemeanor, punishable by fine, for wrongfully labeling the Wealthy apple. This apple has made its way and created a name for itself. It has advertised the state of Minnesota horticulturally more than any other one fruit which has been produced. To sell an inferior product by labeling it "Wealthy" is fraud.

I predict that in twenty years about a half dozen of the present standard varieties of apples will be planted. The remainder will be discarded or practically obsolete, because better varieties will be found to take their places.

This state could well afford to pay $10,000 for an apple that will meet the conditions now calling for a prize of $1,000. These conditions are: To be "as hardy and prolific as the Duchess, with fruit equal to the Wealthy in size, quality and appearance, and that will

Digitized by Google

keep as long as the Malinda." To these qualifications should be added one other, the tree should be tested and planted over a wide extent of country to ascertain whether it will meet the requirements. Trees are frequently a success locally, but a failure when planted at distant points, under varying conditions. I predict that the State Fruit-Breeding Farm at Excelsior will have a half dozen varieties that will meet these specifications in the next quarter century. I hope we shall all be here to greet their arrival.

I predict that the Minnesota Fruit-Breeding Farm at Excelsior will prove one of the best and most useful investments the state has ever made, and that new varieties will be originated at that station superior in hardiness, quality and adaptation to many of those now being propagated; that grapes will be originated of fine quality, sufficiently hardy to withstand our climate; that pear trees will be grown that are as hardy as an apple tree, with fruit of fair quality.

The Minnesota Horticultural Society stands for the best. Its recommends should carry the weight of authority. Great care should be taken by the society not to weaken the value of its authority. Fruits and trees are sometimes recommended by the society for hardiness and planting which in a year or two are omitted from the list, sufficient reasons not being given for the change. We believe it would be wise for the committee upon the planting list to get together before the annual meeting and decide upon the fruits they wish to recommend or omit, and have the same published in the November number of the Minnesota Horticulturist, and then have this list taken up for discussion and each addition or removal voted upon by the society before a change is made. This will require time, but the program can be arranged so there will be sufficient time for this discussion, which should be profitable and valuable for reference. It means a great deal to the planter who follows a list recommended by the Horticultural Society as his guide only to find out a few years later that the society was mistaken in its recommendation.

In the growing of apples for the year 1911, according to the U. S. reports, Minnesota stands first, with a percentage of 90. Opportunities for the profitable growing of fruits exist at home which are overlooked largely because the people do not know of them. How to secure this information and get it to the people is a question for serious study.

It is not generally known that the state of Minnesota took first and second prizes at the Second National Apple Show, held at Spokane in the year 1909. The exhibit consisted of one barrel of Wealthy

Digitized by Google

and one barrel of N. W. Greening apples furnished by The Jewell Nursery Company, of Lake City, Minn. Minnesota also took first prize at the Fourth National Apple Show held at Spokane in November last, as shown by the following telegram: "Spokane, Wash., Nov. 29, 1911. To The Jewell Nursery Co., Lake City, Minn. Accept our hearty congratulations in winning the first prize in Middle West Special, with score of ninety points out of a possible one hundred. Premium will be sent you in a few days. Hoping you will exhibit with us again. Signed, National Apple Show." The exhibit consisted of one barrel of Wealthy apples. The exhibit was in competition with entries from the following states: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota and Wisconsin. What's the matter with Minnesota? She's all right!

Mr. Kellogg (Wis.): What do you consider the cost of a bushel of apples?

Mr. Smith: In the state of Washington, the cost is from fifty-one to sixty cents. As near as we can figure it out, it costs not quite as much in this state. It depends a good deal upon the locality. If they have irrigation to contend with, we have other difficulties to offset it. I consider the average cost here about forty-five cents a bushel.

Mr. Clarence Wedge: Is that based on selected apples or total crop? I understand in the western orchards they market only a small portion of the total crop.

Mr. Smith: I do not know about that, but I would include only those which are actually marketed.

Mr. D. W. C. Ruff: Is that estimate based on a fixed expense and does it include interest and tax on the land?

Mr. Smith: Everything possible, all possible expenses, interest, taxes and everything.

Mr. Ruff: What is the value of the land? That would make some difference.

Mr. Smith: That is quite a difficult question because values vary so much in different localities. We have a bluff orchard on which these apples were grown, and the land was originally valued at ten dollars per acre, and we consider that land worth now not less than a hundred and fifty dollars per acre. We based it on the assessed value, and the assessed valuation of that land would probably be not more than twenty dollars.

Mr. A. W. Richardson: When you say forty-five cents is the cost, does that mean delivered at the railroad station or to the place where they are sold?

Mr. Smith: The place where they are sold. That includes every possible item of expense, freight and everything else.

Mr. Sandvig: In regard to labeling apples with the right name. If a man buys trees and buys the Wealthy and gets something else,

Digitized by Google

who is to blame, the nurseryman, the man who buys the trees and grows the apples, or the grocer who sells the apples? (Laughter.)

Mr. Smith: I don't think that question was asked with the idea that it would be answered, but it might apply to some other varieties than the Wealthy. The Wealthy is so well known that it cannot be mistaken for anything else, and the nurseryman, the grower, the orchardist and the groceryman are all to blame if they do not label a Wealthy correctly.

Mr. Henry Husser: There are a great many that do not know, and it would not be right if they were punished for their ignorance.

Mr. Smith: There are some apples that are not a credit to the state of Minnesota, and I believe it should be made a misdemeanor to label an inferior apple the Wealthy.

Mr. Kellogg (Wis.): How can you tell the Peter from the Wealthy?

Mr. Smith: I cannot, but the Peter is a good substitute for the Wealthy, and the man is not cheated when he gets either one, because either one is satisfactory.

Mr. C. F. Gardner (Iowa): We shall have to call on Wyman Elliot to tell us the difference between the Peter and the Wealthy. He is the only man in this society apparently that can tell.

Mr. Sahler: Several years ago I had the enjoyment to get some Winter Kings from a certain place in this state. I was mighty glad I had six Winter King apple trees, because I thought I had something that not everybody else had. When they came into bearing, and I made an exhibit, to my surprise and astonishment when they looked at my little exhibit of Winter King they told me it was the Malinda, and it was the Malinda. (Laughter.)

Mr. Smith: There are several varieties that are so near alike that you can scarcely tell one from the other.

The President: I want to take this opportunity to congratulate Mr. Smith and Mr. Underwood, of the Jewell Nursery Co., on the great achievement of Minnesota in growing the best quality of apples in the Central West. I might add West as well as Central West.

Mr. Kellogg (Wis.): Two years ago at the National Apple Show, they had no competition, now they have the whole West to compete with, but with the twelve states they had to compete with they beat them anyway. (Applause.)

COMMUNICATION FROM C. L. SMITH.—Mr. C. L. Smith, now of Spokane, Wash., one of the oldest members of the society, whose name appears upon the roll in 1866, a very prominent member for a quarter century, is still in the harness as noted in the following communication just received. "Still active in horticultural work. Forty acres of orchard just outside city limits of Spokane. Five children married. sixteen grandchildren. Farmers' Institute and horticultural expert for large development companies—just as talkative and energetic as ever."

Digitized by Google

VICE-PRESIDENTS' REPORTS 1911

Report of First Congressional District.

HENRY HUSSER, VICE-PRES., MINNEISKA.

The year 1910-11 was a rather peculiar one to the horticulturist. The dry summer of 1910 and the following dry winter seemed to be very trying on all kinds of nursery stock, but our fears were not realized. After a nice supply of moisture in spring of 1911 almost everything leaved out normally. Fruits of all kinds blossomed profusely and set heavily. However, the summer in our section was very dry, and some of the berry fruits suffered. Apples ripened about four weeks before the usual time, and early varieties did not develop to full size on account of overbearing and lack of moisture. Late kinds were benefited by the fall rains and developed well and brought forth more abundant crops of fruit of good size and perfection than was reached for many years before. Thousands of bushels of apples and plums were left to rot to feed the insects for another year. The market was not developed enough to distribute the fruit.

The apple crop was enormous with very few exceptions where blossoms dropped off on the early set fruit. Plums also were overloaded and undersized. Cherries were fair, with a poor yield in southeastern part of our district. Nuts also were very abundant. Strawberries a half crop; raspberries a half crop; blackberries a third crop; currants a good crop; gooseberries a half crop; grapes an abundant crop.

The kind of apples planted is of highest interest. Duchess, Wealthy and Patten Greening are in the lead; Peerless, N. W. Greening, Fameuse and Utter of a second importance; Malinda and Wolf River of third importance. Aside from those mentioned, in limited number are Hibernal, Longfield, MacMahon, Gideon, Anisim and some fair winter keepers, like Ben Davis, Gano, Sugar Loaf, Yankee and others.

In crabs, Whitney leads, but Sweet Russets, Strawberry crab, Briar Sweet, Transcendent, Hislop and others are planted.

Plums include most of the selected native kinds with a sprinkling of some hybrids.

Cherries: Early Richmond and Homer.

Nuts: black walnuts, butternuts and shellbark hickory—all natives.

In berry fruits the strawberry leads. Senator Dunlap leads, with Bederwood next, but Warfield is still in favor with many consumers.

Digitized by Google

Some strawberries are planted for the large-sized fruit, but it seems not to be productive enough, like Glen Mary, Corsica, Tennessee and Brandywine.

Raspberries: Kansas, Cumberland, Columbia, Loudon, Turner, and King.

Blackberries: Ancient Briton, Snider.

Currants: Cherry and Pomona.

Gooseberries: Pearl, Houghton and some Carrie.

Grapes: Beta, Worden, Concord and Janesville.

Spraying was not done to a great extent. However, there were not enough insects around to injure the fruit to any extent.

The Amisim apple carrying its usual load, in orchard of S. J. Evans, at La Crescent, First Congressional District.

Since the people of our part of the country have emerged from the pioneer life and become prosperous, they pay more attention to comfort than before. A fruit garden is no more an exception, and flower gardens get more in evidence every year. Beautiful climbers on houses, fences and trellis can be seen quite often. Prairie Queen is the favored climber among roses. The native bitter-sweet and the Virginia creeper and some other beautiful native climbers are planted. Since we have

Digitized by Google

open ground from the middle of April until end of October, the variety of flowers planted is great, and many beautiful beds rejoice the traveler's eyes. Hardly does the snow disappear when crocuses, daffodils and tulips blossom, followed by pansies and the little blue lily and some German iris, followed by the gorgeous peony, overloaded with blossoms, from clear white to a dark red, perfume the air with sweet scent. Beds of snapdragons, digitalis, larkspur, gaillardias, daisies, sweet williams, phlox drummondi, pinks and others, show very effectively, but of still more effect is often seen a bed of cannas or of gladioli, bordered with geranium, coleus or verbenas, or lobelia and candytuft, and where water is not scarce even some forget-me-nots find some place. Canterbury bells, cosmos and scarlet sage are also shown. Where the root aphis is not destructive to their roots asters can be raised to great perfection. Of the tuberous plants many varieties of dahlias are planted as single plants in the lawns.

To count all the kinds of flowers to be seen in our part of the state, from the early pansies in spring to the dahlias and cosmos in fall, would be too long, and I will only mention yet the nasturtium, petunia, morning glory, moon flower (very sweet scented in the night when open), and scarlet beans, often planted where a climber is wanted for one season only. Often a row of sweet peas sends out its fragrance and makes a beautiful bouquet. Among ornamental shrubs are planted aside our native dogwood and nine-bark the althea, the spirea, snowball, lilac, hydrangea; among ornamental evergreens is arbor vitae, some spruces and pines.

AWARD ON MINNESOTA WEALTHY.—At the time notice was made of the awarding of first prize on Minnesota Wealthy, exhibited by the Jewell Nursery Company at the Spokane Apple Show, in competition with other exhibitors from the middle western states, the extent of the competition was not known, but it has recently come to our notice that there were twenty-eight competitors in this class, which makes the award to Minnesota fruit of correspondingly large value. We certainly have no reason to feel otherwise than proud of what Minnesota can do in the character of the fruit that it grows when exhibited along side of that of other fruit growing regions in this part of the country.

Digitized by Google

Report of Second Congressional District.

C. E. OLDER, VICE-PRES., LUVERNE.

The fruit crop in this district has been very uneven and on the whole not very satisfactory or profitable. The extreme dry weather of last fall and winter and the absence of moisture in the soil unfitted the soil to resist the extremely dry weather and hot winds that prevailed over a good part of this congressional district during all the fore part of the summer and spring and to the last of August. Rains began at that time, and the fruits made a good growth and mostly ripened up their wood in good shape, there being a few exceptions.

Residence of C. E. Older, Luverne, Minn.

Apples were a very good crop as regards quantity, but the quality was poor, and generally the apples were small and not sound. There were very few wormy ones, but on account of the drouth of the early part of the season and the excessive rains of the fall, the apples were in no condition to keep. So on the whole, it was not a very satisfactory crop. Also the birds in some parts were very destructive, taking practically half of the crop.

Plums: In plums the early ones as a whole were small and inferior, but the late ones, especially when well mulched, were exceptionally fine. According to the majority of the reports, the DeSoto was the best in both quality and quantity this season. The Baker, or Stoddard, was exceptionally large and good, other late varieties doing well.

Cherries: No cherries to speak of in the district except in the northeastern part, where there was a light crop and trees looking well now. The Compass Cherry was a fine crop, in every respect, and the trees are in good shape for another crop next season.

Digitized by Google

Grapes are good in the eastern part of the district but in the western there is practically none.

Blackberries are about the same as grapes, both have to be covered in winter for good results.

Raspberries: Very few on account of the drouth.

Strawberries are a total failure, and the vines are gone, only a very few plants growing, and those only where especial care has been taken with them.

There has not been so much *nursery stock* set out as usual on account of the inauspicious condition, and only that has lived that had been cared for in an intelligent manner.

There is no *blight* to speak of this season, and only a very few people have paid any attention to *spraying* their orchards. This is a matter that is greatly neglected, and more effort should be made to induce the people to attend to it, and they will have to do it if they receive the financial results that they ought to get from their orchards.

The late rains have put plenty of water into the soil for winter, and the trees generally seem to be in good condition but not very well budded for a large crop next year; but on the whole a fair crop is promised.

Perennials: Paeonies, Phlox, Irises.

Ornamental Shrubs: Syringas, in assortment, Lilacs of several varieties, Spirea Van Houtii, Golden Spirea, Flowering Almonds, etc.

Report of Fourth Congressional District.

LANGFORD W. SMITH, VICE-PRES., ST. PAUL

The past season has been, generally speaking, a good one for fruit. Apples have produced bountifully this year in the greater portion of the district, although the reports from the northern part show but a fair crop and one almost a total failure. Comparatively little fruit is grown in that section, however.

Apples.—The varieties of apples that appear to have done best in the district are: Wealthy, Duchess, Patten's Greening, Okabena, Hibernal, Milwaukee, Jewell's Winter, Malinda, Tetofsky, Anisim and Hutchins.

For a succession of varieties all suitable for commercial planting, Duchess, Okabena, Wealthy, Patten's Greening, Jewell's Winter and Malinda are good. The Milwaukee may also be included.

The great tendency among Minnesota orchardists has been to too great a number of varieties. For commercial planting three to five varieties are enough for any one. For a home garden the above list with the Tetofsky (which is the earliest) are enough for any one.

Crab apples did unusually well throughout the district. The varieties reported were: Whitney No. 20, Virginia, Florence, Lyman's Prolific, Transcendent and Sweet Russet.

Digitized by Google

For market the Transcendent, were it not for the blight to which it seems extremely subject, is by far the best. Virginia and Florence are about equal, Lyman's Prolific is a fair seller and Whitney 20 is too large for a crab and too small for an apple. The Sweet Russet or, in fact, any yellow crab, is a drug on the market, it being almost impossible to sell them, their color being against them.

Plums: The plum crop in this district has been the largest in years, of fine quality and size and comparatively free from insect pests. The varieties reported as having done the best in the district are: DeSoto, Cheney, Stoddard, Wyant, Wolf (free stone), Surprise, Forest Garden, Terry and Hawkeye. In my own orchard the Hawkeye, DeSoto and Forest Garden did the best, and over a series of years the Hawkeye has proven the best bearer with me.

Residence of Langford W. Smith in Dakota Co., near St. Paul.

Cherries: Practically no true cherries are raised in this district, as they do not seem adapted to this section of the country. In one instance light crops of Wragg and Homer were reported. The Compass Cherry, however, was reported to be bearing heavily throughout the district.

Grapes: Not generally grown in the district, but crop reported good where grown. Varieties reported: Beta, Concord and Moore's Early.

Blackberries: Not generally grown; crop fair with good prospects for the coming season. Ancient Briton only variety reported.

Raspberries: Generally speaking the crop was good throughout the district. The north central part of the district report damage from the drouth of 1910, winter-killing and cut-worms. Varieties reported: King mostly mentioned, also Loudon, Turner and Miller.

Strawberries: The strawberry beds suffered severely from the effects of the drouth of 1910; then the hot, dry spell in June this year cut the crop short. However, the beds are reported as going into the

Digitized by Google

winter in good condition. Of the varieties reported as doing well in the district Senator Dunlap seems the favorite. Splendid, Warfield, Haverland, Bederwood, Glen Mary and Brandywine were also reported.

Currants: Not generally reported but bore a good crop this year. Varieties reported: Perfection, Fay, Pomona, London Market, Wilder and Red Cross.

Gooseberries: Not generally reported but bore a good crop this year. Varieties reported: Carrie, Houghton, Downing, Pearl and Champion.

Comparatively little *nursery stock* was set this year aside from replacing, but all set is reported in good condition, and the prospects are for a large planting next spring, owing somewhat to the fine fruit crops of the past season.

Filling spraying machine at platform in Langford W. Smith's orchard.

Very little *blight* was reported this year; Transcendents suffered as usual. The orchard reported as being most affected had been highly fertilized the year previous with the pulp from a potato starch factory. In my own experience I have also noted this fact, that highly fertilized orchards of varieties subject to blight suffer therefrom. So it seems that one of the ways to combat blight is not to fertilize heavily varieties subject to blight.

Very little *spraying* was done this year, no one reporting systematic spraying.

Although the soil was extremely dry last winter very little *winter-killing* was reported. Trees set in the spring of 1910 seemed to have suffered the most. Many varieties of trees held their leaves late, though in most cases the wood was well matured.

Digitized by Google

All trees, shrubs and fruits are going into the winter in good condition, although in some cases it is reported that wood is not quite mature. Heavy fall rains have supplied the soil well with moisture, but the lateness of frosts kept plants growing too long.

The varieties of desirable and hardy perennial flowers reported from the district are: Peonies, Iris, Phlox, Hemerocallis, Pyrethrum, Golden Glow, Elegans Lily, Oriental Poppy, Columbines, Larkspur, Bleeding Heart, Gaillardia, Hollyhocks, Shasta Daisy, Lilies of the Valley, Forget-me-nots, and Boltonia Asteroides.

The varieties of hardy ornamental shrubs reported as doing well in this district are: Spireas, Honeysuckles, Mock Orange, Hydrangeas, Alpine, or Crandall's Currant, High Bush Cranberry, Lilacs, Elders, Snowball, Berberry, Buffalo Berry, German Pea Tree, Weigelia Eva Rethka, Viburnum Opulus, Viburnum Sterilis Opulus, Berberis Thunbergii.

Three of Prof. Hansen's sand cherry hybrids, the Opata, Sapa, and Hanska, are a very desirable addition to the home fruit garden.

Several persons report an increased interest in shrubbery and flowers for beautifying the home grounds, which is a decidedly good thing.

A friend of mine reported a very interesting experiment and one that was entirely new to me. That was the ripening of the tomatoes left on the vines when the frosts come in the fall. When the first frost came he pulled his vines, leaving the green tomatoes on them and hung them away in the cellar, and found that the tomatoes gradually ripened, and in consequence he extended his tomato season all of six weeks. It was past the middle of November when he told me of it, and he was still having ripe tomatoes for his table.

LIFE MEMBERSHIP AS A PREMIUM—In the November number reference is made to an offer of life membership in this society as a premium in connection with the Becker County Fair, and in writing this note it was our understanding that the life membership was offered by the county fair association. It seems, however, this is an error on our part and that the membership was offered and given by Mr. Geo. W. Harris, of McHugh, Minn., superintendent of the horticultural exhibit at their county fair. Mr. Harris writes me that it is his purpose to continue this general benefaction in the interest of horticulture at their county fair. What others are there who would like to pursue a similar public spirited plan to advance the interests of horticulture in their respective counties, to say nothing of the material assistance it gives to the State Horticultural Society?

Digitized by Google

Report of Fifth Congressional District.

H. H. POND, VICE PRES., BLOOMINGTON.

It is a great pleasure to me that it fell to me to occupy the position of vice-president on the year which produced the greatest apple crop which the state of Minnesota has ever seen. This season has been the exemplification of the old proverb, "It is always darkest just before dawn." One year ago our apple trees were going into the winter with the ground for the most part as dry as it ever gets. The surface soil was dry, and the subsoil was dryer. The trees had endured a drouth lasting from early spring to the setting in of winter. They had also undergone an unusually early and warm spring, followed by a terrible freeze, which killed the leaves and the blossoms as well. Of course, there was much apprehension for the safety of the trees at the time of the winter meeting, one year ago, and some were even advised to go home from the meeting and haul water and water their orchards, notwithstanding winter conditions prevailed, and the ground was frozen.

Snow came early and furnished a good protection, however, for the first half of the winter. But then a thaw came and left the ground bare mostly for the latter half.

So our fears seemed well grounded right up to the coming of spring. Then we began to say, "The apple trees are alive above ground, anyway, but I don't know how the roots are." But the sequel proved them all right in the main. Very few reports have come in of winter-killing of apple trees or of any other fruit except strawberries.

From all over the district except two orchards come reports of a large crop of good, smooth apples, whether sprayed or not. Some sections say no spraying; others several sprayings; but all "good, smooth fruit." The two exceptions reported one-half crop,

I have noticed, however, that some of the old trees of Patten Greening, Okabena and Wealthy which carried large crops failed to bring them up to normal size, and many of the apples were no larger than crabs, showing no doubt that they ought to have been thinned.

Plums bore a heavy crop of good, smooth fruit, mostly no spraying, but the fruit was good, whether sprayed or ont.

The market and prices were good at the beginning and end of the season, but in the height of the season the Minneapolis market was glutted, and prices were very low.

This is the first good crop of plums for several years. No crop of cherries except Compass, which was very good, and in some places of Homer. Grapes a fair crop. Blackberries a poor crop. Raspberries

Digitized by Google

good in the Minnetonka region, very poor elsewhere. Strawberries were a very poor crop.

The drouth of 1910 killed most old plantations of strawberries, and new settings did very poorly and were so injured by drouth that they succumbed to the winter in many cases, even though well covered. As the drouth continued in the early part of the present season, few strawberries were set, but those few have done well and entered winter in good condition.

Very little blight occurred in this district this season, though there is considerable sun-scald and some bark blight, causing disease of the forks and breaking down of the trees. The Peerless, Duchess, Repka and Wealthy have all suffered more or less in this way.

All fruits may be said to be in good condition for the winter. But the early coming of winter probably caught some uncovered, such as raspberries, which should be covered with soil.

Varieties proving best are as follows:

Apples: Wealthy, Patten's Greening, Duchess, Okabena, Hibernal, Peter, Longfield, Repka, Peerless, Utter, Malinda—in the order named.

Cherries: Compass and Homer.

Raspberries: King, Minnetonka Iron Clad, Cuthbert, Loudon and Miller.

Strawberries: Dunlap, Warfield, Splendid, Bederwood and Crescent.

Spraying was practiced to some extent, the following sprays being used: Bordeaux mixture, bordeaux with paris green, sulphur and lime, arsenate of lead.

Leaves hung late on some trees, in fact, many apple trees still hold them.

MEMBERSHIPS AS PREMIUMS.—Mr. Alfred Terry, of Slayton, Minn., one of our old life members, is setting a good example in remitting to this office $2.00 in payment of two annual memberships in this society, to be given to worthy students in the Minnesota College of Agriculture. Just how these memberships may be awarded has not yet been decided, but they will be placed to advantage, we are sure, in connection with some contest there which will stimulate interest in horticultural work. This is a good example which other members may feel inclined to follow to the advantage of those who might in this way acquire an interest in the work is well as in the society itself.

Digitized by Google

Report of Sixth Congressional District.

HAROLD SIMMONS, VICE-PRES., HOWARD LAKE.

The year 1911 will probably go down in horticultural history as productive of the largest fruit crop for Minnesota of any year up to date.

Strawberries were a short crop in this district, but prices were very satisfactory. Senator Dunlap was the favorite variety.

Red raspberries were an enormous crop, with the King as the favorite among commercial growers.

Black raspberries yielded heavily; Older and Gregg most generally planted.

Black raspberries ready for winter in young orchard at Mr. Harold Simmons'.

Currants were a heavy crop, and fortunately were all marketed before the worms appeared. Long Bunch Holland, Fay's Prolific, Red Dutch and Perfection. Gooseberries, a heavy crop; Houghton, Downing, Pearl and Red Jacket most generally grown.

Apples, a maximum crop, quality above the average. Plums, a good crop of excellent quality.

Orcharding is enjoying a boom, and several orchards of one thousand trees or more are being planted in the vicinity of Howard Lake.

Spraying is becoming the regular thing, and prospects are for larger crops of better quality.

Digitized by Google

Report of Seventh Congressional District.

J. L. TEIGLAND, VICE-PRES., MINNEOTA.

The season of 1910 was remarkable and very trying on all horticultural interests in the district. The spring had opened up unusually early and warm, and unfolded the leaves and bloom on the trees. Later on an unprecedented cold wave swept over the country, which killed the bloom, leaves and even considerable of the older growth of trees. The summer following was very dry, and the ground was very dry when it froze last fall, which made the orchardist apprehensive of the results if a severe winter should come on. The public

Golden willow as a snow-trap.

was warned by this society through the public press to take measures to protect their orchards by mulching them, which, I believe, was done by many.

However, the winter was unusually mild, so that even peach and pear trees should have come through the winter in first class condition, so the recommendations of the society was not given a test. There was no winter-killing except on strawberries, and that was probably caused by the drouth.

In the southern part of the district we were again visited by a severe drouth this summer, but the northern part had plenty of rain all the season. We have had plenty of rain the latter part of the summer and fall, and the trees are now in good condition, so I believe the prospects are bright.

Digitized by Google

The following information was secured from about fifteen correspondents throughout the district and partly from my own observations.

The apple crop through the southern part of the seventh district would not quite average a normal crop, and the fruit did not keep nearly as well as usual. In the northern part of the district the crop was good and there was no complaint about its keeping quality.

Plums were reported a big crop of extra fine quality by nearly all. One extensive plum grower reported that "the dry weather seemed to wipe the plum rot off the face of the earth, as far as he was concerned, and he expected better plums for the next few years."

Sixteen feet of snow behind a snow trap at Minneota.

"There is no great loss unless there is some small gain."

Of cherries there do not seem to be hardly any grown except the Compass. Several reported big crops of this, and it seems to be in considerable favor.

Grapes bore a good crop, especially the Beta, which seems to be a success where other kinds fail.

Raspberries were a very light crop, and nobody seems to be raising blackberries.

Strawberries were almost a complete failure. The plants winter-killed badly, and those which lived did not seem to have enough vitality to produce much fruit.

Digitized by Google

Those who mention gooseberries and currants generally report big crops.

Prof. Hansen's hybrid plums and cherries were enthusiastically mentioned.

There has been the usual amount of nursery stock planted, and in the northern and northeastern part the average results were good. In the southern part there has been an enormous amounted killed by the hot and dry weather.

One writer stated the situation as follows: "Most everything is now dead as a result of the drouth. Farmers are looking vainly for the tree agents to fill replace orders."

There has not been much spraying done, but where tried the result has been good.

Planting List. Apples: The list recommended by this society, and especially the following: Wealthy, Duchess, Patten's Greening and Okabena for fall, and Malinda, Jewell's Winter and Milwaukee for winter apples.

The Hibernal is probably not of much value except for a stock for top-working on, and for planting next to the road, or on the outer sides of the orchard, for to impress a certain class of people that stolen fruit is not always sweet.

The Whitney, Florence and Early Strawberry crabs are good.

Grapes: Beta. It will succeed without covering.

Raspberries: Sunbeam and Minnetonka Ironclad without covering and other kinds if you cover them.

Blackberries: Let some one else raise them.

Plums: The list recommended by this society, to which should be added Prof. Hansen's hybrid plums and cherries.

These hybrids, like the one that has been known to the fruit growers for some time, the Compass cherry, starts bearing almost at once and are heavy bearers of fruit of fine quality. The different kinds will give a great variety of flavor, and they differ considerably in size and season.

The following perennial flowers are hardy and desirable: Peonies, phlox, oriental poppies, achillea, columbine, iris, tiger lilies, tulips, dahlias and others.

Hardy shrubs: snowball, H. B. cranberry, spirea van Houtii, flowering plum, mock orange, lilacs, honeysuckle, rugosa rose, rugosa hybrids.

Clematis paniculata is one of the hardiest and most beautiful climbers grown. The hybrid perpetual, June, and climbing roses will make beautiful ornaments if they are well covered in fall.

Digitized by Google

Report of Eighth Congressional District.

C. S. KETCHUM, VICE-PRES., BROOKPARK.

Owing to the lack of spare time, as leisure hours were few and far between the past season, my personal observations are rather limited and wholly confined to my home locality, which is located in the southwestern part of Pine county, or near the center of the district.

Here with us all kinds of small fruits grow wild, and even plums and apples, but the latter are of no particular value unless the tree might be grown for grafting.

There seems to be very little interest in the horticultural line in some parts of the district, more especially the northern part; as from the twenty-two report blanks sent out only nine replies were received and only two from the north.

Residence of S. P. Crosby, at Braham.

On the 20th of August I visited the orchard belonging to Charles Louis, which was a beautiful sight at that time, the apple and plum trees loaded to their utmost capacity. The Duchess, Wealthy, N. W. and Patten's Greening apples and the Wolf, De Soto, Surprise and Cheney plums.

On September 2nd I was at Mr. Uri Miller's place, where I saw plum trees ready to break with their load. He has a fine young orchard, composed largely of seedling plums of his own nursery, the most of which are not in bearing yet.

A severe hail storm sadly damaged what few trees I have on my place and did the same to everything else in its path. This storm was

Digitized by Google

one and a half miles wide by some five or six miles long. Many of the trees are so badly bruised that it's doubtful if they are worth further notice. Nearly, if not all, the apples, crabs and plums on the list have been planted and are doing finely, with bumper crops in most sections.

Cherries and grapes have not done much here yet, but the Compass cherry and Beta and Moore's Early grapes seem to do the best.

Raspberries: In the red varieties the Sunbeam and King are our market berries, but the Loudon is a favorite with some. Blackcaps: Older and Kansas.

Strawberries: Senator Dunlap, Warfield and, in some places, the Brandywine do well.

Blackberries not grown yet, except the wild ones, and they don't grow very large here.

All berries are reported as a short crop, owing to dry weather at ripening time.

Gooseberries and currants an excellent crop everywhere I learned of.

There are few commercial orchards here yet, but there will be, as there is more orchard land opened up.

In small fruits, some have planted several acres. One man at Hinckley sold over $700 worth from one acre this season

Perennials: The peony, phlox, tiger lily and golden glow seem to be most generally grown, while the iris are grown to some extent.

In Ornamental Shrubs: The lilac, snowball, upright and wild honeysuckle and the flowering almond.

The rose, too, has its place in many homes, and one climbing rose at the home of Mr. Richard Hoagland, of Brookpark, had more flowers than I had time to count.

There has been but very little spraying done yet, though where it has been tried it was with excellent results. Blight is practically unknown.

Trees had their leaves in good season and with a fairly good growth; the wood is well ripened, and with plenty of moisture they are going into winter in good shape.

THE TERRY PLUM.—Martin Penning, of New Ulm, one of our experts, says in regard to this variety: "The Terry bore exceptionally well this year on my heavy timber soil. The crop from the Terry trees was so good and the plums were of such quality that I have decided to discard the Weaver, New Ulm and the Surprise and plant the Terry in their places. I received fifty cents more per bushel for the Terry than for the rest, which is an item worth considering when in the plum market."

Digitized by Google

Report of Ninth Congressional District.

A. A. DE SMIDT, VICE-PRESIDENT, BATTLE LAKE.

The season has been quite discouraging for various reasons; drought, late frosts the previous spring, causing weakness in fruit buds; still amid all, the fruit crop was very good, far better than expected, with an abundance of plums such as has not been for years, both wild and tame.

The following varieties are listed:

Apples: Crop very good of the following and no blight, trees going into winter quarters in good condition; plenty moisture: Duchess, Patten's Greening, N. W. Greening, Wealthy, Okabena, Anisim.

Crab Apples: Whitney, Ely Strawberry, Virginia, Hyslop, Minnesota.

Plums: Wolf, De Soto, Surprise, Cheney, Wyant.

Cherries: Good crop of Compass and wild.

Grapes: Beta, Concord, Worden, all ripened fair crop.

Blackberries: Fairly good crop of wild; small crop of tame, as very few are planted. Varieties: Snyder and Ancient Briton are doing best here.

Raspberries: Fair crop. Varieties: King, Columbian, Older. Crop of wild quite plentiful.

Strawberries: No crop, too dry. Dunlap for general planting. Wild and tame are being crossed and are doing nicely, better than the average tame berries.

Currants: Very good crop. Red Dutch, White Grape, Perfection, Victoria.

Gooseberries: Fair crop of the following varieties: Downing, Pearl, Houghton.

Hardy perennial flowers that do well are: Peonies, phlox, iris, etc.

Ornamental Shrubs: Syringas, hydrangeas P. G., spirea V. H., and lilacs.

PLANT WALNUTS.—This is the suggestion of one who has had a considerable experience in this direction. There are hardy walnut trees to be found here and there throughout the southern half of the state, seed of which should be generally planted wherever it can be secured. Members of the society who have walnuts in bearing will do fellow members a favor by announcing it in the Secretary's Corner of our monthly, so that those who wish to plant may know where the nuts can be secured. They should be planted very soon after ripening in order to insure good germination.

Digitized by Google

Apples on Sandy Soil.

COL. FREEMAN THORP, HUBERT.

Growing apples on the dry, sandy land in the severe cold of northern Minnesota and throughout the Northwest until now has baffled us all, but a way has been found, and it is so radically different from anything before attempted that I ask your careful attention, for it proves that several ideas long accepted as axioms of horticulture are, so far as their application to northern Minnesota is concerned, entirely erroneous: for instance, clay soil or clay subsoil and northeastern slope. Instead, the deepest sand with no clay subsoil, and on the very summit of the highest land we have, is what we need to insure success, and on such land apple trees by the new method can be grown with greater certainty and success in northern Minnesota than they can be grown by the best method heretofore used on clay soil and northeastern slope in southern Minnesota or northern Iowa. Most radically wrong for northern Minnesota and the Northwest is the root-pruning of the young trees before setting them. The new method eliminates all possibility of root-killing either by the cold of winter or the drouth of summer or, what is still worse, the drouth of winter. This alone will make apple growers sit up and take notice.

The method is to start with one-year old trees—in three years they will be larger and better than if you start with older trees. Pay your nurseryman extra to dig the trees for you so as to preserve the full length of the roots. Plant them only on ground that has been cultivated and well fertilized with manure from the black muck meadow, from the barn or by plowing under clover. Measure the longest roots of each tree and dig the hole for it four feet in diameter and two and one half feet deeper than the length of the longest roots. Before you begin to dig the holes, plow a deep furrow about seven feet away from where the row of trees is to be planted, put all the good top soil from the hole in a pile by itself and then throw all the rest of the dirt into the furrow. Then fill the hole one foot deep with the top soil that you plowed up. Then hold the little tree so its longest roots not spread much will just touch the top soil you have put into the bottom of the hole. Then fill in between and around the roots from your pile of top soil and dig enough more to fill up to where the roots join the stem and press down with your foot. Then put in three pails of water, and after that is all soaked in put on two inches of loose top soil, and your tree is planted, and planted right—with the crown two inches below the surface of the dirt in the hole, but that surface will be sixteen

Digitized by Google

inches below the surrounding level of the land and below that the ends of the roots are a good deal deeper down than they would be if it was the ordinary nursery tree root pruned.

Until the tree is in full leaf loosen the dirt around it after each rain to prevent evaporation, but do not fill in any dirt, but after the tree is in full leaf then after each rain rake in from the outer edge of the hole enough dirt to make a mulch of loose dirt; by fall this will give a saucer shaped cavity about eight inches deep with ten inches of dirt above the crown of the roots. The growth of these trees during the summer will be surprisingly great. About the middle of August stop stirring the dirt, and to more effectually stop new growth and ripen the wood about September 15th pinch out the end bud of each branch.

When the time of continuous freezing weather comes put four or five pails of water into each cavity when it is freezing and let the ground freeze up wet. When it is well frozen fill the cavity even full with black muck or manure as free as possible from straw and not quite touching the tree. The trees need no protection in summer except from the rabbits, and for this purpose I prefer wire fly screening, leaving it on summer and winter. To prevent the sun thawing in winter (I consider sunscald a misnomer) pick the husks off from cornstalks, feed the husks and set the stalks up around the tree and tie the tops with twine. The roots of the tree in winter are protected by a blanket of ten inches of frozen dirt covered by eight inches of manure or muck, hence they encounter no greater degree of cold here than the roots of apple trees in Ohio or New York encounter, and this method insures the roots plenty of moisture winter and summer and better than any plan yet tried holds back the buds from starting too early in the spring. When the buds do start remove the cornstalks and when the trees blossom remove the manure or muck from the cavity, scattering it on the higher surface to be cultivated into the ground.

During the second summer stir the ground in the cavity and the ground of the whole orchard, after each rain, whether it is planted to some crop or not, to prevent evaporation, but don't let the cavity around each tree fill up any more. Each succeeding winter repeat the application of the water, manure and cornstalks.

There are many things of minor importance that I have found that it would take too much of your time now to go into. If the society will designate some one to write an article for publication, expressing in a friendly spirit the queries and doubts, if any suggest themselves or may be suggested, I will reply in the same spirit and the more public discussion the better.

Digitized by Google

Six Perennial Plants for Northern Gardens.

DR. H. M. SPEECHLY, PILOT MOUND, MAN., DELEGATE MANITOBA HORTICULTURAL SOCIETY.

I have chosen these six perennials as subjects for discussion, first, because they are—possibly with one exception—plants of the hardiest nature; secondly, because in leaf and flower they are all very lovely; and, lastly, because each type has many variations. Given, then, a perennial with such a trinity of points, you may be sure that you will have a plant of much value for our Northwestern gardens. There are some flowers, too, that have a peculiar value to those of us who can see the true spiritual side of a garden of flowers. I mean the power that certain flowers have of awakening tender chords of feeling for home and its gracious associations of love and youth—a power that, long spaces of time after youth has fled from us, melts the hard crust of materialism and makes us feel young again. Of such a sort are my six perennials.

Let us take them according to their seasonal growth. And first is the Columbine, sometimes called Aquilegia. I prefer the first name, not only because it recalls visions of "Mary, Mary, quite contrary," but also because it requires very little imagination to connect its derivation from the Latin word, "Columbo, a dove," with the dove-like shape of the sepals. Aquilegia for a scientific name is attractive and easy to pronounce and is derived from "Aquila, an eagle," in reference to the hooked nectaries which are likened to an eagle's hooked beak. Columbines are alpine and meadow perennials of the Buttercup order, which offer a great variety of delicate shades of white, blue, rose, buff, yellow, scarlet or purple. We grow them for their early hardiness, their quaint form, and their cool color, not for their scent. The foliage, too, so freshly green, is by no means its least charm. High in the Rocky Mountains, low in the English dells, upon the Siberian steppes, or away up on the Altai range between Siberia and Mongolia, as well as in our own bush districts, the dainty Columbine abounds. It likes a good soil, plenty of individual space and a shady, cool spot rather than the full blaze of sunshine, where from seed sown this year it comes to maturity two years later.

Next comes the Iris, the German variety, well called "the poor man's orchid," an excellent name when you consider the delicate beauty of the standards and falls of the commonest varieties, which any decent gardener will give away for the asking. This is the national flower of France, elegantly styled by a nation given to natural

Digitized by Google

elegances the "fleur-de-lis;" and that is what the Mennonites of southern Manitoba call it, too, I am told. Equally pretty is the name "Iris," because, in the old pagan poetry of Greece and Rome, Iris, the goddess whom Homer personified as the messenger between gods and men, gave her name to the rainbow. Note the marked contrast between its plain, sword-like leaves and the rainbow tinted flowers so delicately veined and patterned. For the Northwest the German kinds, the rhizome-rooted and the Siberian with tufted roots, are the best. Do not try the bulbous Spanish and English varieties because they will not stand the climate, which is also much too dry for the Japanese Iris. About the end of May, just when yellow single tulips

Inside lawn and flower beds at Dr. Speechly's.

are blooming, I have a dwarf, dark blue Iris in bloom, but the others are June-blooming. Last spring was too dry for most of the tribe. Divide your clumps often and in the fall, which is the best time for replanting. In fact, you have to divide up your clumps after two years, or they will overrun the gardens.

Next in order and toward the end of June the Oriental Poppy will flame out amidst the rising greenery most gloriously. Is it orange or is it red with black-based petals, this huge flower like a big teacup for size? Place it in the middle of your perennial border, not too far back, where its rough-haired, feathery leaves show off their beautiful pattern. It is as hardy as horseradish and requires a fair amount

Digitized by Google

of elbow room. Its taproots run deep, but in July the foliage soon withers down, when it may be cleared away or allowed to disappear beneath the pressure of its successors on the stage of life.

These two last have but little scent. Not so our fourth example, the noble, generous Paeony. Yes, that is the way to spell it, because it is named after an old Greek doctor of medicine, Paeon by name, according to Homer. In fact, to be called a son of Paeon meant "a physician." And Dr. Paeon it was who used the roots of this plant we call the paeony for healing purposes. My friend Mr. C. S. Harrison, of York, Neb., says that in the mediæval times, "the seeds were taken at bedtime to prevent nightmare. Steeped in liquor and drunk

Dr. H. M. Speechly among his flowers.

before and just after the new moon, it was a sure cure for weakness of the back. If children were sick, then a piece of root must be hung about the neck." And Mr. Harrison goes on to say: "We well remember in the days of small boyhood the gardens were searched for 'piny toes' to steep for us when we were sick!" And so it comes that lots of people know the Paeony better when you tell them about the "Piny Rose," which twenty or thirty years ago was almost the only common type, the old "Officinalis Rubra," whose blooms are a dark, glossy purple—red and rank in odor, so unlike the many improved types, such as "Festivia Maxima," with the delicious odor of a rose. Notice the suitability of the Paeony as a border plant along a driveway, especially if well sheltered by trees, but remember that it dislikes

Digitized by Google

any competition with strong, growing roots of shrubs or trees. Even when its flowers are gone, the glossy leaves are very handsome.

To my mind, it is far better to grow Paeonies than roses in the average northwestern gardens. I do not say that you cannot get good results with hardy roses in certain favored localities and by careful management, but for rural gardens by preference get a good selection of Paeonies. One or two points worth knowing about the Paeony are these: After transplanting, Paeonies do not bloom well until the third season following, and some Paeonies will never bloom at all, being barren. Treat these latter after Mr. C. S. Harrison's advice:

Front lawn at Dr. Speechly's residence, in Pilot Mound.

"Throw them over the fence or put them on the bargain counter for that cent individual who wants the very cheapest." Again some Paeonies bloom well only in certain localities, and all resent the neighborhood of spruces or maples, whose vigorous root growth is too exacting to the Paeony. Do not ask for a little seed so that you may raise seedlings, because it takes three to six years to get any results. Our modern Paeony is the result of patient crossings of varieties from China and Siberia, Japan and Asia Minor. In planting roots, do not break the buds, which must lie two or three inches below ground; nor must you snap the roots, but give them lots of room and place them in a sloping position at about an angle of forty-five degrees.

The tallest growing perennial in the list is the stately Delphinium, a Greek name supposed to have some connection with the temple of

Digitized by Google

Apollo at Delphi; but I much prefer the homelike name of the Larkspur, so called because the nectary is like the spur seen on the feet of certain larks. If this plant will grow abundantly in the valleys of the high Thibetan plateau, 12,000 feet above the sea, it is not surprising that it is quite hardy for the Northwest. But you must protect it from strong winds by planting it in clumps or rows near your shelter belts, or else its spires of lovely blue, blue and white or purple, will never reach their normal height of anywhere from four to six or even eight feet. The flowering time is around about July 15th, and they seed so abundantly that year by year it is necessary to keep the plants thinned out. The proper place for the tall Larkspur is right at the back of the perennial border, where its leaves and stems form a handsome background to all other herbs.

My last is a plant which blooms much later than all the rest, so late that sometimes the early September frosts are liable to spoil its bloom. "Phlox" means "a flame," and certainly the brilliance of such varieties as Coccinea justify the name, especially when grown "en masse." I think those of you who have grown the tall perennial Phlox will agree with me that it is rather more tender than any other perennial named in this paper. In the fall, when flowering, it needs plenty of moisture and requires either careful mulching or watering, or both, if you wish to get good flowering heads. Roughly speaking, there are three kinds of perennial Phlox suitable for the garden. These are in addition to the tall Phlox, the dwarf Subulata, of which our Mr. A. P. Stevenson speaks well, and the creeping Reptans variety. Place your tall Phloxes in clumps and in the middle background, where their foliage is useful all the spring and summer.

Now just a final word as to cultivation, which is applicable to all six perennials. They all like rich soil, but beware against applying fresh manure, especially if it be chicken manure. The manure must be well rotted and well worked into the soil so as to become part of the soil. And the two best months in the year for planting are September and October, avoiding the latter half of October if possible.

Digitized by Google

Minnesota as a Fruit Growing State and its Possibilities Compared with Other States.

E. W. REID, MANAGER, PARK NURSERIES, ST. PAUL.

Will it pay? This is the first question that confronts us, not only in this business but in any undertaking one enters. It is a question of dollars and cents unless we enter into it for our own personal pleasure.

Fruit growing in Minnesota is in its infancy, for the reason we have not been growing fruit growers, nor did we educate the present generation, nor are we educating the coming generation to this industry; hence the necessity of importing this class of soil tillers to teach and illustrate to our population of farmers the advantages gained in the growing of fruit instead of small grains.

We have demonstrated in past years that we can grow potatoes and have created a market for this product. We cannot hope to become successful fruit growers or make Minnesota a fruit growing state until a transformation of this character can be accomplished. The tillers of our soil not being educated in this line of industry cannot be expected to take up a calling in which they have not been schooled and be successful. This brings us to the climax—how can it be accomplished?

In the past ten years, or since making my home in Minnesota, I have been closely identified with the fruit industry of the West and the Northwest, yet we know little of the vast proportions of our sister states which are termed *fruit growing states.*

Twenty years ago the speaker had the pleasure of filling an order for the late Marcus Daly for some three or four thousand apple trees that were shipped from Ohio to the Bitter Root Valley, in Montana—now famous for its McIntosh Red apple, yet not one tree in this order was a McIntosh. At that time fruit growing was in its infancy in Montana. What a change! Yet these pioneer orchards that were established away back twenty or twenty-five years ago were the foundation for this industry, and that section of Montana has been boomed as a fruit section. It has grown until most of the valleys of that state have been turned into orchard lands.

Before leaving this Bitter Root Valley I would say, in the last ten years, this valley was practically settled by pioneers, or the actual settlers that were attracted to this section, who paid but $15 to $20 per acre for their lands, and mixed farming was their occupation; but the fruit from these pioneer orchards showed the greater profit, and it became each year a greater fruit producing section.

Digitized by Google

About this period irrigation was established in a small way, and was found to make the industry more profitable. The first company "went broke," but the possibilities were so great that men with means bought up the water rights and land, in fact, sub-companies secured options along the entire valley, and the first settlers were bought out and looked for other fields. This famous valley passed from the pioneer stage to the commercial stage in fruit growing, and for the past five years it has been the mecca of the "tenderfoot" or the city orchardist who has saved a few hundred dollars to buy a fruit farm on the installment plan. Many of you have been approached with such a proposition.

One associated with the nursery business knows the possibilities held out in past years, but they have reached the limit. That section is ready to receive the commercial fruit grower. Trees were planted in large quantities, and these tracts were sold in sub-divisions of from five to ten acres to the "tenderfoot," and will in many cases revert to the commercial grower, who, being skilled in growing, handling, spraying and cultivating, will reap the benefit.

The question of profit now arises. If there is a profit in growing apples in Montana, Washington, Oregon or Idaho—these states that are so far from the actual markets of our country—why can not the experienced grower reap greater profits close by the actual market? Minnesota does not produce five per cent of the fruit it consumes. Why? Because our state has been known as a grain and dairy state. Yet before us lies one of the greatest opportunities to become a fruit growing state, yet because we have not advertised or catered to this class of farmers our state has not the percentage we should have in this profession.

Can we produce fruit? Every one in my hearing can answer this question, but any in this building who are consumers and not producers, as myself, know well the percentage of fruit consumed grown in Minnesota is very small. Then conceding we can produce fruit, and knowing that we can produce it of the best quality, it is up to this society to educate our people to grow at least sufficient fruit to supply our own demands.

It is true we cannot grow the great variety grown in some other states, but all states have their drawbacks. In fruit centers, fruit is shipped in, but we can, by growing the best of what we produce, increase the demand for the home product. Would there be any demand for the Washington, Idaho or Montana irrigated apple in the Twin Cities if we were placing on the market fruit grown in our

Digitized by Google

midst, properly graded and packed in nice, clean packages, making them appetizing?

Apple growing in Minnesota is profitable, and can be made very profitable, if we plant such varieties as are best suited to our soil and market, care for the trees, giving them the same attention as they receive from growers in our sister states—where the land sells at $500 and upwards per acre—cultivate, prune, spray, thin and use the same care in marketing, gathering, growing and packing as they.

We have farmers who grow good horses and others who grow poor horses; we have among us good doctors and poor doctors, and presume that we have among us those who are good fruit growers and those who are poor fruit growers. Hence the important question is securing sufficient of the former that they are enabled to educate the latter, and to show the "mixed farmer," or the one who has been producing grain, that there are profits in fruit growing as well as general farming.

It has never as yet been my pleasure to visit an up-to-date orchard in Minnesota. What I mean by this is, one that has had the proper care or where the fruit was handled in the proper manner. If it had I could point you to a profitable investment. I do not say there are not such. I have visited a number of orchards at times, and refer at this time to those in Dakota county, where the trees were the picture of health, loaded with fruit. These orchards were profitable, still had little or no care, simply a hit-and-miss proposition. Had these orchards been cared for scientifically, with a system of placing the fruit on the market, they would have shown from 50 to 100 per cent more profit than they did. Convince yourselves of these facts. Visit your commission houses and ask to be shown Minnesota fruit. Question the commission man, or the head of the firm as to why they do not care to handle Minnesota fruit. For the reason it is not put up in an attractive manner—not handled properly—hence not the demand.

I have visited Third street in our city in the summer and fall months, and there was no demand for Minnesota apples that were shipped in bags, soap boxes and other boxes of different sizes, kegs, barrels of all sizes, except the uniform size. Do you expect that handling fruit in this manner will attract the buyers' attention? It must be sold at a discount. On the other hand, had this same fruit been handled properly, packed in clean packages of uniform size and properly graded it would have commanded a good price. I have made this statement on several occasions, that the opportunity that is set before us today in this and adjoining counties from a fruit-growers' standpoint is not excelled. Think of it! Over one million

Digitized by Google

consumers in five of our cities going out of our state for 95 per cent of the fruit we consume, and I believe for 75 to 80 per cent of the apples we consume, yet we can grow just as perfect, just as good quality as any other section.

Go to your grocer today, ask to be shown Minnesota grown apples —what is the answer? I venture to say that in a period of ten years, using the same means, brains and skill used in fruit growing sections by men who understand the business, double the profits can be made per acre than in any of our sister states.

Opportunity meets you on every hand, the land is not expensive, the cost of growing not so costly, and, greatest of all—the market at your door.

Seedling Apple Contest—Free to all.

Seven Hundred Dollars Offered
by the
Minnesota State Horticultural Society.
$100 Per Annum for Seven Years.

Every Person interested in securing better kinds of apples adapted to Minnesota conditions, who has not already done so, should plant a few apple seeds this spring and enter for these prizes. It costs nothing to enter, and the trees grown must surely be of some value.

There is still plenty of time to plant seeds and take part in this contest if scions are cut from trees growing from this seed within two years from now and top-grafted into some old tree to bring them into early bearing. The last premium being paid in 1918, there is still six years, and four or five years should certainly be sufficient time to bring them into fruitage. We hope every member who has a few rods of ground to spare will certainly take part in this interesting and valuable contest.

The conditions governing this contest are as follows:

First. Competition is restricted to the western half of Wisconsin, the two northern tiers of counties of Iowa, all of Minnesota, South Dakota, North Dakota and Manitoba. Competition is open to any one within these limits.

Second. The prizes offered are seven, of $100 each, one to be given in 1912, one in 1913, one in 1914, one in 1915, one in 1916, one in 1917, and one in 1918. They are offered for the best late winter seedling apple, keeping at least until March first under ordinary cellar conditions, to be grown within the above described territory, and the trees bearing this fruit must have been grown from seed planted since the year 1905.

Third. Entry for competition for these prizes must be made with the secretary of the society within one year of the planting of the seed.

Fourth. When making entry the competitor must state when and where the seed was planted, giving the name of the variety of apple and where grown from which the seed planted was taken.

Fifth. Seedlings grown from seed taken from apples grown outside the limits described above are not eligible for this competition.

Sixth. A seedling apple having taken one of these prizes cannot take another under this offer.

Seventh. The same person may make any number of entries and should make a separate one for each planting of seed from each variety of apple.

SEED FOR DISTRIBUTION.

Send a dime to the secretary of the society at any time prior to early planting time in the spring of 1912, and (while the supply lasts) he will mail you a package of twenty-five seeds suitable for this contest.

You should certainly have a part in this interesting experiment. Instead of sending a dime for a package of seeds, send in a new member, and if requested when sending (not later) a package of this apple seed will be sent you free in addition to any other premiums already regularly offered.

Every Contestant for these prizes and every other person engaged in any way in the "origination of horticultural plants adapted to Minnesota" should become a member of "Plant Breeders' Auxiliary." **There is no membership fee,** but one must first be a member of the Minnesota State Horticultural Society.

For blank form of application, apple seed, entries, etc., address A. W. LATHAM, Secretary, 207 Kasota Block, Minneapolis, Minn.

Digitized by Google

GARDEN HELPS

CONDUCTED BY

The Minnesota Garden Flower Society

(Formerly The Minnesota State Rose Society)

Edited by MRS. E. W. GOULD, 2644 Humboldt Avenue So., Minneapolis.

WHAT IS BORDER PLANTING?—The term is often seen in the various floral catalogs and garden magazines, but all do not understand its meaning. By border planting is meant the planting of a strip against some background, such as a fence, a house, a row of trees or shrubbery. The border is laid out with an irregular line to the front, making the bed much wider in some places than others, the object being to simulate nature's graceful curves instead of adopting the gardener's formal straight lines and rectangles. Within this irregular space plants are massed as closely as possible, with tall growing things in the rear, then grading down to low plants along the front edge.

It is customary to use shrubs and perennials, filling in towards the front with annuals; but it is not necessary to wait for shrubbery to grow, as it is possible to have a very pretty border from annuals and bulbs alone and at much less expense. These, too, are especially recommended where it is not desirable to establish a permanent border.

A better arrangement can be made by starting the plants elsewhere, in a seed bed or cold frame, transplanting them to the border as wanted—though the seed may be sown directly in the bed if preferred, thinning the seedlings out to give proper space.

The following list of varieties is suggested, all of which are of easy culture, and adapted to make a showy border and to provide an abundance of bloom throughout the season.

10 TO 12 INCHES

Ageratum
Butterfly Flower (Schizanthus)
Eschscholtzia
Mignonette
Portulaca
Alyssum
Dwarf Nasturtium
Petunia
Phlox
Pink
Verbena

1 TO 2 FEET

Aster
Balsam
Calendula
Coreopsis
Larkspur
Lavatera
Mourning Bride
Poppy
Salpiglossis

2 TO 3 FEET

Four O'Clock
Marigold
Oenothera
Perilla
Salvia
Zinnia

3 TO 4 FEET

Ostrich Plume Cockscomb
Dahlia
Gladiolus
Kochia, or Summer Cypress
Euphorbia Variegated (Snow on the Mountain)

4 TO 5 FEET

Tall Canna
Cosmos
Hollyhock
Spider Plant
Sunflower

This list is offered from which to make selection. The number and variety to be used must be determined by the available space. As a rule the greater the number of varieties, with close crowding, the handsomer will be the border. EMMA V. WHITE, Minneapolis.

THESE LONG WINTER EVENINGS is a splendid time to do much important garden work, and the work done now will be so much gained when the spring rush is upon us. With paper and pencil plan your garden for 1912.

How can you improve upon that of 1911? Are there certain flowers that would flourish better in another location?

How about your color arrangement? Have you enough of that eternal peace maker, white, a mass of which will harmonize the most clashing colors? Have you plenty of green background, gained by trees, shrubs or vines upon your walls and fences?

Send for the new catalogues and try some of the novelties and be ready to report to this society as to their desirability in this climate.

You can supply yourself now with all the little extras that might take a half day to get ready when you should be out in the garden, such as labels, stakes, strings, and even poisons for spraying.

Have you any old seeds left from last year, or seeds of your own gathering? These you can test now and so know whether it will do to use them.

Old pansy plants that are out doors can be lifted during a thaw, or dug up from under the snow and put into a window of a moderately cool room. These will soon show bloom.

Digitized by Google

SECRETARY'S CORNER

ABOUT PLANT PREMIUMS.—Members sending in for plant premiums are urgently requested to send at the same time the number of their membership ticket, which will save considerable work to the office.

BLACK WALNUT SEED.—Mr. A. Schlemmer, of Chisago City, Minn., writes that he has about a peck of black walnut seed on hand grown from a tree on his own place, which is still in suitable condition for planting. Any of our members who would like to secure some of this seed are requested to correspond with Mr. Schlemmer.

PHOTOGRAPHS WANTED.—We are always glad to receive good photographs of horticultural objects of interest, whether in connection with some article presented at the annual meeting or not, but especially do we desire them from those who were on the program of the last annual meeting and can furnish photographs illustrative of the topics presented. Such photographs will be cared for and returned as early as may be.

SEEDLING CONTEST.—The particulars of the seedling contest have been reprinted in full in this number and will be found on page 78. There is time yet for participants in this contest, and a considerable quantity of Wealthy apple seed, as well as that of some other varieties, has been secured for this purpose. In sending in a new member do not fail to ask for this seed if you wish to participate, or it will be sent out to any one at ten cents per package.

ANNUAL MEETING, MANITOBA HORTICULTURAL SOCIETY.—The annual gathering of this society will be held in Winnipeg on Thursday and Friday, the second week of February. Who of our members will be in Northern Minnesota at that time whom we can call upon to represent this association at that gathering? We should by all means send them a representative in recognition of the services of Dr. Speechly, who was with us during our late annual meeting.

TOP-WORKING EXPERIMENT.—Arrangements have been made for furnishing trees both for stock and for grafts, that can be sent out to 200 members, so that many may participate in an experiment in top-working that promises so much of value to the Minnesota orchards. On the inside page of the back cover of this monthly will be found particulars. We hope there may be even more than this number who desire to take part in this experiment, and should this limit have to be raised other varieties may have to be substituted, but the experiment would still have practically the same value.

MEMBERSHIP ROLL FOR 1912.—The annual list of members for the year 1912 at this date, Jan. 24th., stands at 1216. which is a very satisfactory number, being some 260 more than last year at the same date. This added to the life list of approximately 300 gives us on the total roll something over half more than at the close of the preceding year. Who are there in your vicinity, dear fellow member, that should belong to this association? Valuable premiums are offered for securing new members, and we hope it may seem worth your while to take part in this sort of service for the society. Have *you* renewed membership for 1912?

Digitized by Google

Digitized by Google

MR. SETH H. KENNEY, OF WATERVILLE, MINN., AMONG HIS APPLE TREES.
AN IMMENSE CROP ABOUT READY TO HARVEST.

Digitized by Google

☞After reading this magazine, will you please pass it along to some friend who will appreciate it and whom you may perhaps interest to become a member of the society—at least he should derive benefit from its reading. By distributing in this way the twelve magazines received during the year 1911, at the beginning of the next year—upon renewing your membership in the society—you will be entitled to receive postpaid a cloth bound volume containing all the magazines for 1911 and much other interesting matter, with a full index of all its contents, entitled "Trees, Fruits and Flowers of Minnesota," a handsome book for your library and invaluable for reference.

THE MINNESOTA HORTICULTURIST

Vol. 40. **MARCH, 1912.** **No. 3.**

Top-Grafting Apples on the Virginia Crab.

A. J. PHILIPS, WEST SALEM, WIS.

After trying to grow apple trees on their own roots for a number of years, I became satisfied that many of our failures with the half-hardy trees was caused by a lack of vigor after bearing heavy crops to enable the trees to recuperate.

The idea came to me that grafting onto a very vigorous stock would overcome that defect to some extent. So I began to look around for the hardy stock. I at first tried the Transcendent, but in the winter of 1878, at the winter meeting of the Minnesota Horticultural Society, held at Rochester, Mr. A. W. Sias, of that city, showed a tree of the Virginia crab that had made a growth of seven feet the past season. That growth convinced me that it must have a very vigorous and strong root. So before I went home I bought twenty of those trees, and this proved to be one of my most profitable apple growing investments. The grafts grew so well that for the next twenty years I set every year more or less of those trees for top-grafting, with the result that when I sold my orchard two years ago, I think I had the largest number of top-grafted apple trees on the Virginia crab of any orchard in the state.

Now I think the advantages gained by using this stock are four-fold. First, it grows a stronger tree. Second, it hastens fruiting. For instance, the Malinda, one of our best long keeping apples, while it will not bear much on its own roots until ten or twelve years old, if top-grafted on the Virginia it will bear good crops at from five to eight years old. Third, it increases the size of fruit of almost all varieties. That this is correct I can prove by saying that for many years I have selected my fruit for exhibition purposes from the top-grafted trees. And, fourth, it increases the longevity of many varieties. For instance,

Digitized by Google

thirty years ago I set two rows of trees twenty feet apart. Row No. one, of twenty trees, were two-year old Wealthys that bore well for many years but have been dead now for ten years. Row No. two were two-year old Virginia crabs, which when three years old were top-grafted with Wealthy scions. Of this row, the most of them have borne the past season—as Prof. Cady, of your college, can certify to.

Another advantage gained is the fact that by this plan half hardy varieties can be grown in abundance, as the beautiful Jonathan, Grimes Golden, McIntosh Red, Windsor and Utter I am showing on this table amply prove. This collection of twenty-four varieties of winter apples I here exhibit I have never seen equalled during my forty years of apple growing in Wisconsin or Minnesota. One old apple grower said it was worth five hundred dollars to the future apple grower of Minnesota, and another said one thousand and so on up, until the last one, who has been growing apples for fifty years, became enthusiastic and said it was worth ten thousand dollars to the young growers of either Wisconsin or Minnesota. But I do not expect to get half of that from either state and throw in all the choice kinds I have of new seedlings too.

After a temperature of forty below and the continued cold of any especially severe winter, I always expect to see the best show of apples in my old orchard the next summer on the top-grafted trees.

Several have said why use the Virginia for a stock when Hibernal, Martha and Minnesota crab and other varieties are just as good. I say, just as I say about dairy cows, I tried the other breeds and found the Guernsey the most profitable—so I used that breed. So with stocks: I tried a half-dozen different kinds—have the Utter on seven different stocks—and found the Virginia the best for my soil and conditions, and so I used it. And were I going to set on soil similar to my old orchard I would set Virginia first, last and all the time. In this I am not alone, as Mr. S. D. Richardson, a veteran grower of your state, says exactly the same thing or words to that effect. I have no desire to get into any discussion or quarrel with any one on this subject. One tree costs about the same as another, and I say emphatically, if you or any one likes Hibernal better than Virginia—why for pity sake use it, especially if you have it.

A few words of explanation about this exhibition of twenty-five varieties which I brought here for instruction, not for a premium. Here are Avista, Eureka, Russetts, Wolf River, Scott's Winter, Malinda, Dudley, McMahon, several seedlings, Dominion Winter, Fameuse, Newell, Phoenix 50, Dartt's Best Winter, Walbridge, Northwest-

Digitized by Google

ern Greening, Milwaukee, Ben Davis, Gano, Jonathan, McIntosh, Windsor, Utter and Pewaukee, and I think they are as fine a lot as can be shown anywhere. These go to show that top-grafting on the Virginia with me has certainly been a success. (At the close of the annual meeting where this exhibition of top-grafted apples was made, we packed the entire lot in a large box, and Professor Hansen shipped them to Brookings, S. D., to be shown at his meeting January 16, 17 and 18, where I had a chance to talk to or about them again. The people of South Dakota seemed much interested in and asked many

A. J. PHILIPS, West Salem, Wis.
From photo taken in January, 1912—aged 78 years.
(An earlier portrait will be found in the report of this society for 1898, opposite page 440)

questions about top-grafting. Prof. Hansen had this fruit in his cellar for over five weeks and many of them, like Jonathan, Windsor, Malinda, Northwest Greening, Avista, Ben Davis, Scott's Winter and Scott's Winter seedling, were as nice as they were when shown at Minneapolis.)

The President: There are few men in this Central West that have done as much for horticulture, especially in the way of growing apples, as Mr. A. J. Philips. He has one of the best orchards in the country and his advice is good.

Digitized by Google

Mr. A. J. Philips: I do not own the orchard now, but I have a few trees in my garden only. The man to whom I sold the orchard knows nothing about apples, but he offered me a chance to exhibit this fruit, and I am now doing it.

Capt. A. H. Reed: Is the Wolf River worth propagating?

Mr. Philips: Why, yes, they are no good, but people want them. I have seen young fellows come along and pay ten cents for one of those apples, and one fellow gave me a quarter for an apple to give to his girl, and that would have paid for half a dozen or more Wealthy apples, which would have been good to eat and pleased his girl a good deal better.

Mr. Graham: What would you advise top-working on the Hibernal for commercial purposes?

Mr. Philips: Nothing.

Mr. Husser: How would you proceed to start a commercial orchard—how would you start with the experience you have?

Mr. Philips: That would depend a little on how much land I had. If I had land enough I would set a thousand Virginia crab trees, and then I would top-work them as fast as I could.

Mr. Bubak: I would like to ask why it is, if you are able to give any explanation, why you do not think the Hibernal is as good to top-work on as the Virginia crab. I am here to defend the Hibernal.

Mr. Philips: Yes, that's right, defend it. I have not said a word against the Hibernal.

Mr. Bubak: Yes, but you have not said a good word for the Hibernal.

Mr. Philips: Well, I don't want to fool the people. (Laughter). I didn't say a word against the Hibernal. I have tried it, and I don't want it. Why do I like the Guernsey better than I do the Jersey or the Holstein? I tried them, and I know, or I think I know, what is best for me in the way of cows, and in the same way I have found that the Virginia is better than anything else I have tried. But that is not saying anything against other varieties, and if the Hibernal is the best thing for you, why, top-work it! I found a man this morning who had ordered a thousand to top-work on. I had to buy my trees, and it is no object for me to say that the Virginia is better than the Hibernal, because you can buy them just as cheap as you can the others, but all there is about it is that I like it better.

Mr. Bubak: Does it not make an inferior fruit in size?

Mr. Philips: If you will bring me a lot of Hibernals that can beat these (indicating the apples on the table), I will give you my farm.

Mr. C. G. Patten (Iowa): There is one feature about this discussion that is quite important to my mind. All along down the Mississippi river, on the bluffs in Iowa, as far as that bluff formation extends out into the prairie regions, the Virginia is all right. It blights very little, as Mr. Philips has said, and it is a hardy tree and a fine bearer, but when you get west into the black soil of the prairies, when you get west into Dakota, it is a failure. It is just as much a failure

Digitized by Google

in South Dakota as the Martha crab is in this region, and so it is a failure practically when you come to central Iowa and the West. So what may be good in one place is not good in another. The Virginia is all right up this way, but in the West it is a failure on account of its inability to endure climatic conditions.

Mr. Philips: Yes, sir, that's right, I have not said anything to the contrary. I have taken the position all along that for me it was the best thing.

Mr. Husser: What would your choice be for stock to top-graft on, Mr. Patten?

Mr. Patten: I have no choice except in the general way that I have indicated. But in every portion of the state where top-grafting is done the Hibernal seems to have the preference over any other tree we have, or any variety of Russian apples we have.

Mr. Bubak: I believe there is more profit in Hibernals producing an early crop top-worked than in any other variety. Last year I top-worked the Ben Davis on the Hibernal, and this year it produced quite a cluster of blossoms, and that is quite an encouraging feature for eighteen months growth. I tried that on the Hibernal, and I think for me the Hibernal is the best.

Mr. Philips: I want to tell you I found a Malinda in Iowa twelve years old that had not borne any apples, and I found the trouble with the Malinda was that it did not bear young. I got some scions of it and top-grafted them on both the Hibernal and the Virginia, and I had them bearing on the Hibernal and the Virginia in three years after I grafted them.

Fruit Exhibit at the St. Paul Land Show.—Pursuant to the wishes of the society at the late annual meeting, the fruit exhibit made at the meeting was transferred in large part to the Land Show at St. Paul, where it proved a valuable addition to the state exhibit as a whole.

A resolution was adopted by the committee having charge of the state exhibit there and was accompanied by a letter from the committee, a part of which is quoted herewith.

"At a meeting of the Minnesota Exhibit Committee held this afternoon at which there were present Dean A. F. Woods, C. W. Glotfelter, Prof. C. P. Bull, Fred Sherman, of the Immigration Department, R. W. Wheelock and J. H. Beck, at which affairs of the committee were wound up and a survey of the work done made, it was the unanimous expression of the members of the committee that they and the people of the state of Minnesota are under great obligation to the Minnesota Horticultural Society for the most excellent fruit exhibit installed and maintained by the Society. We believe the Minnesota Horticultural Society has performed a great service to the state in competing so creditably with the much exploited western-grown apples. The society gave ocular demonstration of the fact that Minnesota can and does grow apples the equal of those grown anywhere."

Resolution. The Minnesota State Horticultural Society having provided, installed and maintained a most excellent fruit exhibit at the Minnesota exhibit of the Northwest Land Products Show, therefore, be it

Resolved, By the Minnesota Exhibit Committee that it send this resolution expressing the thanks and appreciation of the committee in behalf of the citizens of our state for the excellent exhibit provided and the hearty co-operation of the Horticultural Society in making the Minnesota Exhibit a proper representation of the agricultural resources of the state. It helped materially in winning the first prize for the Minnesota State Exhibit.

Digitized by Google

Attitude of the Nurserymen of Minnesota toward Top-Working.

S. D. RICHARDSON, NURSERYMAN, WINNEBAGO.

It has been demonstrated by many in the Northwest, in Wisconsin, northern Iowa, as well as in Minnesota, that it is possible to grow very choice varieties of winter apples successfully by top-working them on hardy varieties of apple trees.

I would not insult your intelligence a moment by asking you to believe that the nurserymen of Minnesota were not enthusiastically in favor of growing here as good apples as can be grown anywhere in the United States.

It has been demonstrated that the very best trees can be grown by setting the stock where the tree is to stand and after a few years whip-grafting or budding while the limbs are small, forming the top to suit the owner's fancy. Wood grows only as it grows from the outside; when a large limb is sawed off a wound is made that always remains in the center of the limb. When the tree is whip-grafted or budded when small this element of weakness is removed, and such a tree is just as strong as any tree that has not been top-worked.

Many varieties of apples seem to be hardy enough in limb for Minnesota but are affected in body and at the forks of the limbs by our cold winters, which injury can be avoided by top-working.

All Minnesota nurserymen know that it is necessary to secure scions for grafting before their vitality is lowered by the extreme cold. In February of 1884, I cut forty Tetofsky scions and got only one graft to grow. About the same ratio resulted with Minnesota, while scions of Virginia, Hyslop and Transcendent crabs apparently were not injured in the least. In the spring of 1885 Mr. Dean, nurseryman of Blue Earth City, sent me some scions of his choicest Russian varieties, but they were injured with the cold so much that not one of them grew.

You can test the limbs of a tree in the spring with a knife and find the last year's growth discolored so much that it does not seem possible that it will leave out. If the roots of the tree are not disturbed test again in the fall, and you will be surprised to find all traces of injury with the cold removed. If the injury still remains go slow in top-working that variety in Minnesota; it is not hardy enough.

What varieties shall we use to work on? I like the Virginia crab the best of anything I have ever tried. Mr. Kimball, of Austin, likes the Hibernal. Mr. Kinney swears by the Gould crab—I never saw a

Digitized by Google

tree of that variety. I have grafts growing on trees of Duchess, Hibernal, Wealthy, Whitney No. 20, Virginia, Minnesota, etc. Some were grafted or budded when small and some on limbs from three-fourths to two inches in diameter.

It is possible to change the top on quite large trees, but you have to have your top farther from the ground, and there is danger of the graft blowing out when the limb gets large and the tree is heavily loaded with fruit.

In 1842 the most of the orchards in northwestern Vermont, where I was born, were seedling trees. Later there was a general sawing off of limbs and top-working. Ten years after there was much damage done to the orchards by the breaking off of the limbs where grafted. The late Mr. Parks, of Pleasant Mounds, Blue Earth County, Minn., told me that he had given up top-working on account of the breaking off of the limbs where grafted, and he tried it many years before he got discouraged.

In setting an orchard avoid all currents of air caused by the location of groves or buildings. We have had trees killed, root and branch, while trees a few rods distant out of the draft—exposed to the full force of the northwest wind, trees of the same variety—were not injured.

I do not consider trees top-worked in body when small as desirable as larger trees limb-grafted, but that is about all the variety of top-worked trees the nurseryman can supply. If you want trees grafted in the limbs buy the stocks of some nurseryman, set them out and after a year either bud or graft—or get some one to do it for you.

I could show any one with any gumption in ten minutes so he could graft just as well but not as fast as I could myself. A person without any mechanical genius better let some one do his grafting for him.

One great advantage in using some kind of crab for a foundation for a tree is that you can top-work even if the winter should be cold. I have found the Minnesota to work well as a stock both for myself and others.

While the vitality of the limbs is lowered sometimes by the extreme cold I never saw it injured in body, and on account of its slender limb the top can be changed on a large tree easier than on any other variety I ever tried.

Mr. Richardson: I wish to say one word in explanation of what I have expressed here in the paper I have just read. What I have said about the attitude of the nurserymen of Minnesota is my own individual belief. I have not spoken with a single nurseryman and do not wish to appear, and do not appear, as the mouth-piece of the

Digitized by Google

nurserymen, and if there are any here who do not agree with me I trust they will be frank enough to say so.

Capt. Reed: What time of the year do you consider best for cutting scions?

Mr. Richardson: I like to cut them before extreme cold weather sets in, and then keep them where they will be moist. I have a stock cellar, and I put my scions in there, and I never cover them with anything.

Mr. Bubak: What method would you suggest or prefer for covering scions when you put them outside, or cover them in a root cellar?

Mr. Richardson: I keep them only in one way. I do not know anything about any other method.

Mr. Bubak: I had a lot of scions spoil, but those I kept in a cold place on the north side grew very nicely.

Mr. Richardson: I cut some scions once when I first started. I was in Iowa in 1884, and in February, 1885, I came to Minnesota, and I had some scions shipped up from Iowa. I had some scions kept so they had started to heal over, and I understood I couldn't get anything to grow where they had started to heal over, but those I brought up from Iowa did well.

Mr. Bubak: Would it not be desirable to keep them in cold storage?

Mr. Richardson: I don't know. Whatever I might say on that question would only be theory, and theory isn't worth a hill of beans.

Mr. Duffy: I would like to say a few words in regard to the method of top-working, and the main point is whether there is enough gained by going to the trouble and waiting to top-graft. Also whether there is anything gained in the matter of hardiness by top-grafting, or in the size of the fruit. I top-grafted on three different varieties, the Hibernal, the Duchess and the Virginia. As far as hardiness was concerned I didn't see any diffeence, nor did I see any other difference than that the Duchess now and then blighted, while the Virginia and the Hibernal did not. I had different kinds of apples grafted upon them, such as the Jonathan, and I lost them on all except on two trees, and those were the Hibernal and Duchess. I do not say that the Virginia is not worth anything, but that is my experience. I could not get any Jonathan on the Virginia. Two blighted badly, two have been dead for the last three years, but the others did not seem to blight on top-grafted stock. The size of fruit is the same as on the original bud. This year I raised Wealthys just as large on the root-grafted as on the top-grafted trees.

Mr. Richardson: I have two trees about four rods apart. There is little difference in regard to the currents of air around these trees. One tree is a Hibernal top-grafted when the tree was quite small, and the other tree is a Virginia crab. I top-worked a seedling apple on both trees. There were just one or two limbs top-worked on the Virginia crab, and I had more apples on those two limbs than I have ever had on all the Hibernal, and the Hibernal was in bearing before I top-worked it.

Digitized by Google

Prof. Beach (Iowa): I practice a method of keeping scions which any ordinary farmer can practice and keep his scions perfectly. I have known scions kept by this method for two years, and after they were two years old they grew all right. The method consists of putting them into a place where surface water will naturally drain away, so that the water will not stand in the ground. Then you want to get some kind of a box, of whatever size you may choose to keep your scions in. I generally use an ordinary shoe box, about eighteen inches deep, and put over the bottom of the box a wire screen to keep out mice and anything else that might injure the scions. The wire screen at the bottom of this box should be raised about an inch from the bottom so that the air may have better circulation. Then put your scions in the box and cover the box and then cover the whole thing with straw from four to six feet deep and for a distance of about three feet around the box. The advantage of this method of keeping scions is that you can get in there at any time during the winter. By lifting the straw off the box and removing the cover you can get at your scions when you wish to use them. Scions of plums, apples and other fruit can be held in this way for an almost indefinite period, that is for the purpose of grafting, and I do not know of any other way in which they can be held so well.

Mr. Clausen: I tried that for four years, and I had scions two years old that kept perfectly well and grew well when grafted. I have tried a good many ways, but I do not know of any better way of keeping scions than has been explained by Prof. Beach.

Mrs. Stager: I would like to have Prof. Hansen give us his views on the Siberian crab as a stock on which to top-graft. I had some, and I have to give them a black eye.

Prof. Hansen (S. D.): That word Siberian crab is an extensive term and should be modified or divided. The trouble with the Siberian crab is that it overgrows. The pure Siberian crab is not what we want for commercial purposes, because it overgrows too much as top-grafting stock. The Virginia has considerable apple blood in it. As far as budding stock is concerned, that question is not yet settled by a long shot. I know of successful work being done in the old world with it as budding stock. The word "Baccata" will have to be defined as there are many varieties of it. It is in the experimental stage as yet, and should be settled by half a dozen experiments over the state, because I know men who have made a success of it.

Mr. O. W. Moore: I noticed in the December number of the magazine of this society that there is a description there of my orchard, and a notice of the Duchess top-worked on the Northwestern Greening. I just wish to make a little correction in that statement. The article states that my trees went two and a half bushels to the tree. The fact is, they went a little over seven bushels to the tree, or a little over two barrels.

Mr. Bubak: In regard to that Siberian crab. Does it get heavy and break over?

Prof. Hansen: The tendency has been for the Siberian crab when it is top-worked to get too much overgrown, and I would not recommend it except in an experimental way or where you want to get fruit very quickly.

Digitized by Google

Present Status of Top-Working in Minnesota.

W. D. VALLEAU, ASST. IN HORT., STATE EXP. STATION, ST. ANTHONY PARK.

(Made up from reports of members sent to the secretary.)

Because of the large amount of top-working which has been done in this state in recent years it seemed possible that we might collect enough information from top-workers to establish a few principles which might be of value in the future to top-workers in the Northwest.

In order to obtain the desired information blank forms were sent out to the fruit growers of the state. Thirty-one of these were returned, giving some of the desired information. From this number it is impossible to definitely establish any principles that would hold in all cases, but nevertheless they may be of some value.

Work has been done on a great many varieties and also on seedlings. Seedlings as stock should not be used, although they may be cheaper and easier to obtain than named varieties. No two seedlings are alike. They differ in hardiness and in vigor and in their affinity for the scion just as named varieties do, and in using them we defeat the chief aims sought in top-working, a uniformly vigorous and healthy body.

A great deal of work has been done using the Hibernal as stock and with very satisfactory results. This is true for three reasons: In the first place, the Hibernal is absolutely hardy in our climate and is a vigorous grower, thus forming a hardy and vigorous root and body for anything which may be put on it.

In the second place, it has good crotches, thereby overcoming the chief difficulty found in raising to maturity such weak-crotched varieties as the Wealthy.

In the third place, it makes a good union with nearly all of our common varieties, although the resulting trees are usually rather tardy and only mediumly heavy bearers.

This principle seems rather well established, that the better the union the less effect top-working has on the bearing quality of the tree, whereas if the union is poor the fruitfulness is increased, as is shown when the common varieties are grafted on Transcendent crab stock. The union is poor, being very much enlarged, but the trees are early and regularly heavy bearers. The principle involved seems to be the retardation of sap flow at the point of union of the stock and scions, thereby transforming leaf buds into fruit buds.

The Virginia crab is reported as making good unions with nearly all of our common varieties and also as producing trees which are

Digitized by Google

regular, good bearers. But there seems to be a tendency for the graft to outgrow the stock. This, of course, is undesirable. Mr. Reel, of Excelsior, reports that the Northwestern Greening grafted on Virginia crab stock is no more reliable or regular a bearer than when on its own root, although it is perfectly hardy and makes a good union.

The Duchess seems to be only of mediocre value when used as a stock. Patten's, Lowland Raspberry and Early Transparent grafted on Duchess in 1906 and 1907 have produced no fruit as yet. Mr. O. W. Moore reports Northwestern Greening as having done well on the Duchess since 1897.

Mr. Reel, of Excelsior, reports that he has twenty-five Jonathan trees which were grafted on Duchess stock in 1905. They made a good union and are bearing fairly well and so far have proven hardy.

Mr. Greening, of Grand Meadow, reports having grafted a large red variety of apple on the common wild crab stock in 1908. The trees made good, strong, smooth unions, but the grafts outgrew the stock in the three years by one-third. The two trees bore about twenty apples apiece this year. The wild crab very probably would not form a good stock for any but our very slowest growing varieties, as it is a slow grower, and the tendency would be for the graft to outgrow the stock.

The Pyrus baccata, or Siberian crab, although one of the hardiest trees we have, has not proven itself a good stock. It seems to unite very poorly, whether in top-working on large trees or budding seedlings. The grafts do well for a short time but break off readily at the union.

A number of fruit growers have from time to time tried to raise some of the tenderer varieties of apples, as the Jonathan and Grimes Golden, in this section by grafting them on hardy stock. In most cases the trials have been rather disappointing, although in a few cases the trees are doing well and are apparently hardy. A severe winter will usually kill most of them back to the stock, but the experiment is well worth trying as locations may be found where the tender varieties will do very well if put on hardy stock.

Digitized by Google

TRIAL STATIONS, 1911.

(Reports presented at the annual meeting of the Society, Dec. 7, 1911.

Top-Grafting at the Waterville Trial Station.

S. H. KENNEY, SUPT.

For several years my farm has been one of fourteen experiment stations to test the growing of apples, plums, cherries, grapes and berries. I was 21 years old when I first came to Faribault. I shall be 76

One of some fifty Duchess trees in Mr. Kenney's orchard top-grafted with Malinda. Crop over 100 barrels in 1911.

in February. In Massachusetts I had a small orchard. There I learned to love the work of horticulture. I joined the Minnesota Horticultural Society forty-one years ago. I owe very much to this society. For a great many years winter apples had been almost a complete failure. It

Digitized by Google

had been observed for many years that the Yellow Siberian was hardy in Minnesota. Then the next advance was the hybrid crabs. The seed from the Siberian crabs produced the Transcendent, Whitney No. 20, the Gould, and many others. Some of these crabs, notably the Gould, have never failed to produce winter apples when top-worked.

About twelve years ago I sent to Clayton county, Ill., and bought a number of trees called Missing Link, a pretty good winter apple, but so tender that not a tree wintered. I set 1,000 grafts. They nearly all died the first winter, except on the Gould crab; the grafts on this lived. Here I made the discovery that some trees, like human beings, possess greater vitality than others. Since that time I have been testing the vitality of many kinds. As one will see by my report following, there are millions of dollars in store for inhabitants of this state. I will here say I grew over 100 barrels of winter apples on my farm the past season.

The sap of a hardy crab or hybrid behind the graft of a tender variety does not make cions of the top-worked apple hardy as a cion to use elsewhere, but does import hardiness to the seed. The hybrid crabs give this evidence in their vitality.

Newtown Pippin.—Grafted six years ago on Patten Greening; the ends of the grafts killed some; there was a lack of vitality, but have borne apples three years. It should have been placed on Gould crab. This is a west coast apple; we kept it in the common cellar till the next July. It was not wilted. I think it would have kept two months longer. Flavor the very best; good size; apparently without a fault.

Jonathan.—A first class winter apple; green looking in the fall; at this date a high red color. They come from the coast; worth in Minneapolis, $5 to $6 per barrel. First class, perhaps as good as Newtown Pippin. Grafted by my son on Hibernal.

Grimes Golden.—Another first class apple, some larger than Jonathan but equal to it in flavor. The two last apples I obtained the cions from H. W. Kimball, Austin, Minn. Have cut all these three kinds for grafting in the spring. The above three kinds are sufficient for a commercial orchard. Why go to Oregon for apples? They grow in clusters like Transcendents.

Ben Davis.—This long keeping winter apple, top-worked on Peerless or Gould crab, and grown in Minnesota, should not be classed with Ben Davis grown in the south. I think it was six years ago I was at the home of Eugene Cooley, of Morristown; he had several Peerless apple trees that he said did not bear fruit. I suggested that he top-work with Ben Davis. He did so. He has since told me he wished he

Digitized by Google

had top-worked them all with Ben Davis; the high quality of his top-worked Ben Davis on the Peerless enabled him to sell all he could spare at $1.00 per bushel at his home last fall. Wishing to see his apples, in company with Geo. Glotfelter, the son of C. W. Glotfelter, president of the State Agricultural Society, we found the grafts full of average Ben Davis apples; the side not top-worked with no apples. I have had Ben Davis on the Gould that has had apples for several years, but not as good as on Peerless. I top-worked on Peerless a few years ago; last season it grew two and one-half bushels. I sent samples to the St. Paul land show.

Kenney's Seedling.—From Missing Link. Good winter apple.

Kenney's New Apples.—Seventeen grafts on yellow Siberian; one sample full of promise. Winter.

Northwestern Greening.—Top-worked on Alaska. Hardy in being top-worked.

Baldwin.—On Alaska. The cyclone broke the Alaska tree; spoiled over one-half of ten bushels of winter apples, twenty kinds. The tree had dead limbs. I do not recommend it; it was rotten in trunk.

Windsor Chief.—A first class winter apple; cions from Clarence Wedge, of Albert Lea, Minn. Quality fine.

Edson Gaylord's Brilliant.—First class cions from Nora Springs, Iowa. Fifteen apples in one cluster. The cyclone did not blow any of them off.

Missing Link.—Had them twelve years. Long keeper.

Allen's Choice.—From F. W. Kimball, Austin. Good winter.

Seek-No-Further.—Rightly named; high quality.

Gano.—From Westboro, Ohio. Not large but good.

Malinda.—Top-worked on Duchess, eleven years ago. I raised 100 barrels the past season; it has been a source of profit. Not hardy on its own roots; a heavy bearer. First grown in Wabasha county, Minn.

Seedling.—From Mrs. Henry Lynn, of Redwood Falls, Minn. Season, Jan. 1. A valuable winter apple. Beautiful to see.

Rhode Island Greening.—From Mass., on Hibernal. Commercial.

Three varieties winter apples. From Prof. N. E. Hansen, of Brookings, South Dakota, on Gould crab. All winter.

Blue Pearmain.—From Buckland, Mass. Winter; good quality.

Bottle Greening.—From a Mr. Leonard, South Halifax, Vt. These apples were grown from a Vermont seedling fifty-four years ago; they were on my Alaska crab. The storm failed to blow them off; to date all sound. I cut this cion six years ago in November from a tree, from which they just picked fourteen barrels. They promise to be valuable for Minnesota.

Pound Sweet.—Season, October and November, top-worked on Peerless and Patten Greening. First year, one apple; last season, four bushels choice apples.

Digitized by Google

I wish to mention a new apple exhibited at the Spokane Apple Show in 1909 that was six inches in diameter. It was named the Spokane Beauty. I sent to the owner of the tree, and grafted it on a Patten's Greening that was top-worked on Gould crab, as near as I can recall, ten, eleven or twelve years ago. I top-worked eleven grafts of this apple in this Patten's Greening. Eighteen months from the time the Spokane Beauty grafts were set they produced nine apples. Four of these large apples I exhibited at the winter meeting, four I sent to

Alaska crab tree with spread of thirty-four feet, top-grafted with twenty different kinds of winter apples. In Mr. Kenney's orchard.

the St. Paul Land Show, one I wrapped in paper to see its keeping qualities.

Some two years ago received scions of a seedling from the Transcendent crab originated by the Jewell Nursery Company that never to this time has shown any blight. I have six scions of it top-worked on crab stock. Some have fruit buds for next season. I had one scion top-worked on Patten's Greening. It bore full last season. The apples were a little larger and of brighter color than the original Transcend-

Digitized by Google

ent; quality as good as the parent. Wishing to know about this seedling I sent inquiry and received answer from Mr. Underwood, dated Nov. 17th. He says the seedling Transcendent had a medium crop of apples, and the tree is perfectly healthy and has not shown any sign of blight.

The Late Strawberry crab was originated by Mrs. May Horton. This apple has kept good until Dec. 1st, is exactly the quality of the Early Strawberry. I sent samples of these apples to the winter meeting.

Of the fifteen kinds of Prof. Hansen's plums I lost but one. Most of them promise fruit next season.

Many of the varieties of winter apples fruited for the first time, and I am testing the keeping qualities. In the spring of 1885 I lost three hundred Ben Davis three years old. Now I have found that Ben Davis grafted on the Peerless is a perfect success not only at this station, but at Eugene Cooley's, in Morristown, Minn.

The crop of sand cherries, bought from Prof. Hansen, restored my confidence in cherries. The bushes were bent to the ground with valuable fruit. From my observation at the State Fruit-Breeding Station we shall soon raise plenty of the finest fruits of almost all kinds. The top-worked apples on hardy crab stock places all the winter apples in our reach in this severe climate, judging from my experience.

AMERICAN NURSERYMEN'S ASSOCIATION.—The thirty-seventh annnual meeting of this organization will be held this year in Boston, June 12-14. Hotel Brunswick has been selected as headquarters. Program of the meeting can be secured later from Secretary John Hall, Rochester, N.Y.

GIDEON MEMORIAL PRIZE WINNERS.—G. P. Warder, St. Charles, first prize, paper entitled "The Home Orchard;" R. M. Peterson, St. Anthony Park, second prize, paper entitled "A Plea for the Farmer's Garden;" A. J. Lashbrook, Northfield, third prize, paper entitled "The Farmers' Strawberry Bed;" Miss Anna Streed, Little Falls, fourth prize, paper entitled "The Farm Beautiful.

Digitized by Google

Central Trial Station.

PROF. LE ROY CADY, STATE AGRICULTURAL COLLEGE, ST. PAUL.

Prof. Cady (on the left) and his class in greenhouse laboratory work at State Agricultural College.

The past season has been exceptionally good for the development of most all horticultural crops. The tree fruits especially have done well at the station. The orchard gave a satisfactory yield, nearly all varieties bearing at least a few apples. Those doing the best were Wealthy, Patten's Greening, Anisim and Duchess, and among the crabs, Sweet Russet, Shields, Florence and Lyman's Prolific. The Russian orchard, which was originally planted with Russian varieties, a large number of which had died out, was entirely done away with last spring, and this land used as a trial plot for seedling potatoes and variety tests.

Late in the fall a new horse barn was erected on what had been for years the garden and ornamental plot of the station. This will necessitate moving practically all of the garden, vineyard and peony beds to some other part of the campus.

Plums were an exceptionally good crop. Some 4,000 seedlings fruited at University Farm. This fruit was sold or mashed and the pits removed for planting next spring.

Digitized by Google

The grapes did not yield as well as in other seasons, although there was a fair crop. There seemed to be very little winter-killing the past season among ornamentals and fruit, in fact less than had been the case in a good many years previous.

Many of the oaks on the campus have been affected by the borer, which is common throughout the state, and all such have been cut out and burned.

Additions have been made to the Dining Hall and Girls' Building, and a new Engineering Building is to be erected during the next year.

Ornamentals.—Peonies, among the herbaceous ornamentals, did not bloom as heavily as usual, possibly owing to the drouth of last season.

More additions have been made to the hedge plots, and more ornamental planting done. Much more will be attempted along this line next season.

Mr. A. R. Kohler has again had charge this year of the potato and vegetable work, and has conducted experiments in potato breeding, degeneration, spraying and variety tests of both potatoes and vegetables. This material will probably be available in bulletin form in the near future.

The Early Ohio has continued to prove the best early potato and the Rural New Yorker type—Rural New Yorker No. 2, Sir Walter Raleigh, Carman No. 3—have seemed the best late varieties.

Experiments with Bordeaux seem to indicate that it pays to spray both early and late varieties, using about seventy-five gallons per acre where the vines are of fair size. Experiments in quantity of potato seed to plant per acre seem to indicate that twelve to fifteen bushels for early potatoes and ten to twelve and one-half bushels for late, give the best results. Thorough cultivation and plenty of barnyard manure also add to the yield.

Mr. M. J. Dorsey, a graduate of Cornell, began work at the station the first of August along lines of research under the Adams fund. His work will be principally connected with the work at the Fruit-Breeding Farm.

Digitized by Google

Collegeville Trial Station.

REV. JOHN B. KATZNER, SUPT.

This year (1911) has been one of the most successful in horticulture in Minnesota. An abundant crop of apples and other fruits has been gathered. Farmers with but a few trees picked more apples than were needed by the family, and many sold the surplus fruit for a good price to neighbors who were too negligent in the past to plant fruit trees on their own places. Almost all orchards throughout the state proved to be a remunerative investment to their owners. This success in fruit culture this year is most encouraging and is certainly one of the best inducements for still greater efforts in planting and raising fruit trees in the future.

The past season was notable for the early ripening of fruit. Apples ripened from fourteen to twenty days earlier than in other years. The Transparent was ripe July 25th; Tetofsky, July 28th; Patten's Seedling No. 112, August 1st; my wild native grape "Alpha," August 15th to 18th—and so with all other fruits. This early ripening of fruit has much to do with its keeping quality. None of our apples kept so well as in other years. Another peculiarity of some varieties I noticed was their large size. The White Russet bore a fine, large, uniform apple. The Sweet Pear apple, though not uniform in size, had specimens four inches through—almost the size of the Wolf River. The Wealthy did not show up so well. Sorry to say that this fine apple seems to grow smaller as the tree grows older. Some plum sorts were extra large, measuring almost an inch and a half. The grapes were the finest and largest I have ever seen raised here. Some tomatoes weighed a pound and a half. Potatoes were extra large, and many cabbage heads tipped the scale at twenty-five and thirty pounds.

There is another point of some interest I have to mention. My apples were exceptionally highly colored and this at a time when the same kinds grown by others were still pretty green. This was also noticed by Prof. LeRoy Cady, who visited the station last summer. He asked me what I did for my trees that the fruit colored so early. The only reason I could give was that I applied wood ashes, a gallon to a tree, some years ago. And we both were satisfied that this was the cause of the early and high color of the fruit.

The last few years I noticed that a considerable number of apples on the trees were scabby, gnarled and wormy. I was sure that before long I would have to spray. This year, however, the apples were perfectly clean, not a scabby, gnarled or wormy apple could be found in

Digitized by Google

the orchard. I know no cause for this unless perhaps the almost snowless winter together with last year's severe frosts in spring after the warm spell were producing these beneficial results. The same may be said of the plums. This year the fruit was clean and large, with scarcely a worm or a plum pocket.

While many varieties of apples bore a heavy crop of fine fruit, there are some which deserve particular mention. The best bearers this year were White Russet, Tetofsky, Froebles Summer, Duchess, Patten's Greening Nos. 112, 105, 108 and Sweet Pear, with Wolf River and Peerless as a close second. Of crabs the Florence, Shield and Whitney were about the best. The Sweet Pear apple pleases me very much, and I think it deserves to be more planted. It grows to a fine, spreading tree with large, healthy foliage. The stem needs a little protection. The tree ought to be grown in good clay soil; on sandy land it is not much of a success. But on a good location the fruit grows large, is of good quality and keeps a few months. Some of the poorest bearers were the Transparent crabs. No doubt the cause of their non-bearing were last year's late frosts that killed the blossoms and early growth.

When we were picking apples this fall I noticed an odd occurrence on one of our Wealthy trees. There is a branch on the tree that was bearing crab-apples just about the size, form and color of the Greenwood crab, which tree stands quite near to that Wealthy. First I thought it might be the effect of cross pollination, but on closer observation I came to the idea that it must have resulted from bud-variation. The branch does not differ much from a Wealthy branch, but the leaves were only about a half inch wide by two and one-half inches long, pointed and standing upright from the branch. The fruit was distasteful and very bitter.

Our strawberries did not do much this year on account of frost and neglect. The young currant bushes have borne a little for the first time. The grape vines did very well; they set a nice lot of exceptionally large bunches. In fact I never saw them larger. They colored up early and would have been ripe in due time had not the birds from the woods seriously interfered. They punctured the berries as soon as they turned blue and would have spoiled the whole crop. So we cut the grapes just as they were and used them for jelly.

My "Alpha" grape seems to make good. As I said in a previous report, it is a wild, native grape, a true vitis riparia, taken from the woods and not a seedling in the common acceptance of the term. Again it bore some extra fine grapes of large size. Prof. Cady, who saw

Digitized by Google

them, was surprised and admired them much. The bunches may not average quite so large as the Beta, but the berries do, and the quality seems to me better by far. It has a pleasing, aromatic taste of its own, somewhat akin to the Worden. On eating it seems to be a little seedy, for it contains no pulp when well ripened. All parties who tasted the Alpha thought it to be a cultivated variety and were highly surprised when they were told it was only a native grape. Its hardiness recommends it to the experimenter as suitable material for hybridizing. It is not necessary to lay down the vine and cover it for

Charlamoff tree in bearing at Collegeville Trial Station.

winter protection. Prune it in fall and leave it alone. In spring it never starts to grow before the weather is settled and thus escapes the late spring frosts that injure other varieties, tame and wild. But when its time comes, it grows most vigorously and ripens its fruit with the earliest. This fall I have sent the Alpha to the State Fair so people could see it. I do a little propagating now, and in a few years I shall have enough cuttings of the Alpha for free distribution to all who may apply for them. I find that grape cuttings three inches long with one bud started in the greenhouse in February make stronger plants than long cuttings started in the usual way in spring.

Digitized by Google

My pear seedlings are in good condition. Some of those which passed through the last winter grew very well, others did not make much of a growth. This is due partly to cold and partly to lack of cultivation. Young trees in order to make a good growth must be cultivated, and it will be done another season. All pears planted last spring were cultivated, and they made a fine growth. Now they are all protected for winter by a lath being tied on the south and one on the north side of the trees. I consider it very necessary to shade pear trees on the south side to ward off injury from alternate thawing and freezing in spring. The cold of winter does not hurt them much.

Last spring some stock was received from the U. S. Department of Agriculture and well taken care of. While some trees made a good growth, others did not. They do not seem to be adapted to our state. The coming winter may finish most of them. The plum trees from Mr. Charles Patten are in fine condition. Mr. O. F. Brand's apple seedlings No. 1, 2 and Oliver topworked on hardy stock grew very vigorously, and Estaline is a fine grower in the nursery and a very promising orchard tree. In regard to the stock received last spring from the Minn. State Hort. Soc. and sent to the trial station by Prof. LeRoy Cady, I have to report that both Delicious apple trees made only a feeble growth and may be dead by next spring. The two King David trees are dead. The five Hibernals grew well. The two Gould crabs grew only a few leaves. Of Prof. Hansen's hybrid plums, one Opata is alive and one dead. The other hybrid plums are in good condition. The trees were too dry when received.

Having obtained some scions of Prof. Hansen's hybrid plums from Mr. William Pfaender, New Ulm, I did some stem grafting on our native plums with very good results. Where the stock was a little strong the scions made a growth of three feet and more. Egama was grafted on a half inch stem three feet high; it grew a perfect top of seven or eight branches three feet in length. Our native plums seem to be a congenial stock for these hybrids. Egama, Toka, Hanska, Cheresoto, Sansoto and Wastesa were thus grafted for trial, and all made a good growth. Many of them are full of fruit buds, and no doubt will bear next year.

We had much rain the latter part of the season, the ground is well soaked, and the trees will not suffer from drouth during winter. All trees prepared early for the cold season; they stopped growth in due time and shed the leaves by the middle of October. When there is sufficient moisture in the ground trees seem to get ready sooner

Digitized by Google

in preparation for winter than in a dry fall, when they cannot get the necessary water and material from the soil.

This year has given us such an impetus for horticulture that I need not say another word of encouragement to our farmer friends. Suffice it to say that if you have an orchard, take care of your trees, since they will repay you with high interest; if you have no orchard, make haste to plant one next spring. It will become a source of much pleasure and satisfaction for you and your family for many years. Let the good work go on till every farm in the state has an orchard and every family its health-giving fruit.

Duluth Trial Station.

A. B. HOSTETTER, SUPT.

Spring of 1911 opened early at Duluth trial station, the daffodils beginning a few days after May 1st and continuing until late in June, the season of bloom prolonged by different varieties, early and late. We have what we consider an ideal location for them, a sunny, well drained slope. Tulips kept them company, and were fine this year. We have principally the May flowering, or cottage, tulips and Darwins. They have large flowers and long stems, which makes them desirable for cutting. At first we thought the daffodils more permanent, surviving as they do almost any hardship and increasing each year, but the varieties mentioned are proving themselves equally good, especially if left undisturbed. Spring marguerites, pyrethrum roseum, aquilegias, lilies of the valley, peonies, hardy phlox, delphiniums, Shasta daisies, coreopsis, gypsophila paniculata, in quantities sufficient to furnish flowers for cutting, followed in their order of blooming, and we had literally loads of flowers. In hardy plants we have experimented with such as would be not only hardy but suitable for cutting as well; the bedding varieties we mean to try later on. We believe with proper care most perennials of any value would be hardy here. Hardy sunflowers and hardy chrysanthemums survive the winters, but the seasons are too short for their blooming. We were surprised to find a plant of the double, hardy sunflower alive this spring. The most brilliant thing we had the whole season was a row of Lychnis viscaria. We do not find it suitable for cutting, but it is a beautiful border plant aside from this. Hybrid perpetual roses came through the winter in fine shape and bloomed beautifully. We planted some of the wild rose, rosa setigera, hoping that it may prove hardy

Digitized by Google

—we have not found it growing wild here. We try each year to have something new, discarding what is not desirable.

What remained of the 1910 planting of Senator Dunlap strawberries after the dry summer were so scattering we did not try to cover, but they lived and bore well this summer although inclined to run small. This might have been because the soil was not rich enough. Fertilizing for strawberries with us has been quite a problem—barnyard manure is so full of grass and weed seeds that its use has been disastrous. We put out 2,500 Senator Dunlap this spring and have a good stand. They were covered with straw just before the first snow

Spirea Van Houttii at residence of L. B. Arnold, Duluth.

fell, and unless they were injured by the previous freezing and thawing, which began so early this year, they should come through in good shape, and we have planned to scatter some pulverized sheep manure over the field in the spring and possibly use some nitrate of soda to get better berries.

The King raspberries, planted in 1910, made good thrifty growth, and the berries were fine, large and of very good quality. We had a fair crop of currants. There is no question but currants do well here, but we have planned to try some of the newer varieties hoping to get better results. We hope to have some asparagus for market next year.

Digitized by Google

The variety is Palmetto. We planted an ounce of seed of Bonvallet's Giant last spring and will transplant the coming spring. Compass cherries and Duchess apples did not bear, although full of bloom and old enough. About thirty small plum and apple trees were sent us this spring, eight of which did not grow.

We are only just beginning in an experimental way, and there is not a great deal to report. Next spring we mean to put out new varieties of currants, gooseberries, dewberries and blackberries.

One thing we do not have which we know would be a great improvement, and that is a windbreak. We put out one of laurel leaf and Russian willows, but are convinced now that we could not give them the room that they would take, and so in the spring they will be moved and something else planted—evergreens it would be if they were not so slow—otherwise we are not decided.

Excelsior Trial Station.

A. B. LYMAN, SUPT.

Fruit trees came through the winter of 1910-11 in good shape. Many thought the dry soil condition would lead to injury, and it no doubt would have had we had a severe winter. The Wealthys that bore heavily in 1910 did not produce fruit this year, but everything else was loaded. The Peerless that bore a good crop in 1910 were also well loaded this season, and the fruit sold a little higher than any other that we had, as it was of good even size and came onto the market at just the right time. We had several hundred bushels of the Peerless, and the price ranged from $3 to $3.50 per barrel. Late crabs that have heretofore sold from $1.50 to $2.50 per bushel did not bring over $1. There seemed to be an over-supply.

Apples were more perfect this year than usual. It seems that there was too much fruit for the insects to look after. Those that have sprayed regularly are getting better fruit each year. Many are now using the "lime and sulphur" in place of bordeaux, and it is giving general satisfaction. Those that have given their orchards a moderate pruning are well satisfied that it pays. A few thinned the fruit on trees that were overloaded. Where this was done in time much good resulted.

I have heard the Milwaukee well spoken of. It may become a valuable tree for Minnesota.

Digitized by Google

Plums did well this year with a few exceptions. Our Surprise have never fruited, and they have been set for years. Several of the new fruits from Prof. Hansen at Brookings bore fruit, and they give great promise as an early fruit. They are great producers and will sell well in a local market. The Inkpa is the earliest. The Sapa produced a heavy crop of splendid fruit. We have never before seen such crops on trees that were so young.

Some of the older plum trees that have not done well were given a severe pruning, and they have been much improved. The fruit was

The Lyman Nursery.

much larger than that on unpruned trees and was better in every way. The plums seem to require cultivation and pruning for the best results.

While the early part of the summer was very dry, there was during the latter part of the summer an abundant rainfall, and trees have gone into winter in fine shape.

Those that have large orchards are generally well satisfied that growing apples is profitable in this state. Those that were dissatisfied were a few that had a great variety and did not put the fruit up in good shape. Good fruit commanded a fair price even though there was a large supply.

Digitized by Google

Glencoe Trial Station.

CAPT. A. H. REED, SUPT.

At this station, located on the Aberdeen division of the "Milwaukee Road," a peculiar season has been witnessed in regard to weather and crops, and about the same conditions have been experienced to the west line of the state. Very little moisture was precipitated through April, May, June, July and until August 15th, when nearly everything planted or sown had suffered by the severe drouth, but the timely rains in August started all vegetation growing as if by magic, so that the corn and vegetable crop was the best ever produced in this section. The fruit crop may be said to have been "fair to middling." Apple trees presented a very peculiar phenomena in bearing. While some bore reasonably full, others of the same variety had no fruit. Many trees had no fruit on the west side of the branches, while the east side hung full. The Hibernal trees that always heretofore had outstripped all other varieties in producing apples fell short this season in quantity, compared with Duchess, Wealthy and Peerless. My Patten Greenings were almost a failure. Those standing on high ground had some fruit, but the apples were very small—say half of the usual size.

Plum trees of the following varieties, DeSoto, Forest Garden, Hawkeye, Stoddard, Wolf and Surprise, that I had set in the rows with and between my apple trees, about eight feet apart, in the spring of 1908, bore profusely, and when in bloom were a "thing of beauty."

My Compass cherry-plum trees are annual bearers, and I consider them among my most valuable fruit-growing trees.

Having been experimenting in trying to raise pears for the past ten years, I yet cannot report that I have had a tree in blossom. I have tried the Bartlett, the Keifer and the Seckel pears, and all the trees freeze back nearly every winter when the thermometer goes below 20.

Cherries of the English Morello and the Early Richmond I have grown to a bearing age and to four inches in diameter, when they have died.

The strawberry crop in this vicinity was a failure the past season, owing mainly to the dry weather. I set out 2,100 strawberry plants of the Senator Dunlap and Glen Mary varieties, and less than a hundred grew, which was probably from the dryness of the ground. I followed the advice of some old strawberry growers and cut off about one-third of the roots before setting—which I shall never do

Digitized by Google

again, but will set them by using a wooden spud, that I can open the ground with six or eight inches deep and let the roots of the plant when setting go down as low as they will, where I think they will catch moisture enough to retain life and growth.

My experience in top-grafting the past three years has led me to believe that by this method we may produce throughout Minnesota such varieties of apples as the Jonathan, Baldwin, Grimes Golden, Winesap, Spitzenburg, Northern Spy, Roxbury Russett, Delicious, King David and other choice varieties as surely as we do the Wealthy. While none of my top-grafts have fruited as yet, I have not discovered one killed back the past two winters, while the thermometer has ranged below 30 degrees.

Capt. Reed's spraying outfit at work in his orchard. He is holding the hose.

Such grafting has been done in trees rising ten years old and trunks six inches and over in diameter, selecting three limbs in each tree each year from one to two inches through where sawed off and split for the reception of two scions each of such varieties as had been chosen.

I do not think it advisable to graft more than three limbs in the same tree in one year; the second year you can cut scions from the previous year's grafts and graft three more limbs, and so on each year until the tree is completed.

I received from Prof. LeRoy Cady, of the Central Trial Station, scions of the following varieties of apples: Delicious, King David and Lowland Raspberry, with the request that I top-work them upon different kinds of stock and report their growth. I top-worked each

Digitized by Google

variety onto three branches each of two Hibernals and two Peerless, and shall watch them with much interest. Other varieties top-worked were Stayman, Winesap, Northern Spy, Roxbury Russett and Jonathan.

Grafting is one of the greatest discoveries in horticulture ever made, and no one seems to know who made the discovery. Without this process it would be impossible to propagate or perpetuate any of our choice fruits. It is a well known fact that an apple seed will grow into a fruiting tree but may not produce an apple like its parent, because when a blossom opens up the pollen from trees of other varieties is conveyed in some manner to the neighbor blossom—hence the apple seed is crossed while the apple remains the same. The man that had genius enough to discover that by inserting a twig or a bud of some favored variety he could change the whole nature of the tree, became one of our greatest benefactors.

There are several methods of grafting, but the three principal ways are top or cleft-grafting, whip or splice-grating and budding. Cleft-grafting is the most common and simplest. It is generally used in working over old trees. The limb to be grafted is sawed off squarely with a sharp saw; it is then split through the center with a knife or chisel. The cleft is held open with a wedge or chisel while a scion, cut about six inches long and made wedge-shaped, is inserted at each edge of the stump. As the two scions are slipped in place care must be taken that the inner bark of both stock and scion are in close contact; then the chisel is withdrawn, and the stock should close tightly on the inserted scion. Wax of the right consistency is made by melting tallow, rosin and beeswax together and should be carefully spread over every grafted stump to keep out all dampness from the wound. After properly waxing, the Germans usually take a piece of cloth about six inches square, cut two holes in it to let both scions through and then wrap it over the stump, tying it tightly with a string. This seems to protect the wax from melting or washing off by storms or hot days. If the stock or limb to be grafted is not over three-fourths of an inch in diameter, one scion will be sufficient.

Another common form of grafting used for small stock is known as "whip-grafting." It can only be used when stock and scions are about the same size and is the common method among nurserymen in root-grafting.

The Gould crab seems to be the tree most highly recommended for top-working, but my experience teaches me that any vigorous growing variety of apple trees is all right. Go ahead with what you have.

Digitized by Google

I am highly delighted with the system of top-grafting older trees, thoroughly believing that by this system Minnesota will in a very few years be growing her own winter apples, such as Baldwins, Spitzenburg, Roxbury Russett, Rhode Island Greening and any other winter variety produced in the New England states. All we have to do is to send away to some reliable party that is living among some good strain of winter varieties and have them secure and send scions by mail at a very small cost compared with their value. Don't wait! Don't hesitate! Go at your hundreds of different varieties of trees that produce apples that you have to put into cold storage if you want to keep them until December. Southern Minnesota is surfeited with apples in September and October, and later we have to buy imported apples if we want any.

Jeffers Trial Station.

DEWAIN COOK, SUPT.

The season of 1911 at this station was a continuous drouth from early spring until nearly the first of September, more severe than any the writer had ever known. On the 29th of August, the drouth was broken, and from that time on the rains were frequent and heavy, so that when it froze up the ground was thoroughly saturated, and the sloughs were full of water.

Strawberry plants were so weak when the rains came that but few new plants were made. Therefore, we cannot expect a very large crop of strawberries next season.

As to plums, owing no doubt to dry weather in spring and summer, there was no plum rot (monilia) whatever, and we are in hopes that this disease has been entirely eradicated.

Some of the early plums, like the Rockford, that were heavily loaded, were so small as to not be worth gathering, but most varieties of plums were very fine, although a little undersized. The curculio did some damage early in the season, but most of the stung plums dropped to the ground, and when we came to gather the fruit not a sting nor a rot, nor any other blemish, was to be found on any of the plums.

The foliage of about all varieties of native plums had a brown, frost-bitten look (owing to the long, severe drouth) early in August, and with few exceptions (mostly young trees) are somewhat shy of fruit buds for next season's crop.

Digitized by Google

Of Prof. Hansen's sand cherry hybrids, the Opata gave fine results and seemed to be the best of all. The fruit was colored enough for market purposes July 15th.

Another promising sand cherry hybrid is the Wohanka. The fruit is very similar to that of the Opata, only it is a week or ten days later in ripening, and the foliage turns to a nearly blood-red color in late summer.

Of the Japanese and Americana hybrid plums, the B. A. Q. and the Emerald (sometimes called Burwood) gave best results. The birds destroyed many of the Emerald plums as soon as they were ripe, and in exposed windy locations the wind blew a large per cent of the plums off before they were ripe. It seems as if about all of these hybrid plums give better satisfaction when grown in a somewhat sheltered locality.

Mr. C. G. Patten sent me samples of three varieties of his seedling plums. One was an improved and enlarged Rockford, a seedling of that variety; another he called the Apple plum, it being shaped like an apple. It's a cross between the Stoddard and the Wild Goose plum. The other seedling was a cross between an Americana and a European variety (Prunus domestica). The specimens of this variety resembled the Emperor plum very much.

The apple crop was hardly up to the average, either in size of fruit or in quality. However, some of the winter varieties, owing to their later season of growth, after the rains came, were very fine. Among them are the Malinda, Jewell's Winter, Milwaukee, etc. Our Milwaukee apples took the first prize at our county fair as being the best winter apple on exhibition, and also as being the largest apple on exhibition. It seems to be an early bearer and very productive.

Fall apples did not keep as well as usual. A very early spring, an exceedingly dry and hot summer and very wet September, with a bad hail storm and heavy winds, were too much for the keeping qualities of even the Wealthy apple. Of the Wealthy apple there were practically none in our local market after the 20th of September.

All apple trees of the first degree of hardiness shed their foliage at their usual season and are going into winter quarters in good condition, but the Wealthy, Malinda, Lowland Raspberry, N. W. Greening and some others, have still a large portion of their foliage upon the trees.

Digitized by Google

La Crescent Trial Station.

F. I. HARRIS, SUPT.

After the discouraging midsummer report from this station, the reader will be in a measure prepared for the results herein recorded. While it is a disagreeable task to record failures in Minnesota's banner fruit year, I take it that facts are wanted, so I shall try and give an unvarnished account. This will also serve to prevent the usual sameness in the reports from the different stations.

McMahon apple tree in blossom at Mr. Harris'.

The crop of apples was the smallest ever harvested at this station, excepting of course last season's universal failure caused by the spring freeze-up. As the blame must rest somewhere I have decided to lay it all up against that same fatal frost! Of my orchard, containing nearly 3,000 trees of bearing age, the experiment part consists of about 2,000 trees of more than 100 varieties, and these are all situated on a northerly slope. Not a single bushel of merchantable fruit was harvested from this portion of the orchard. As this is generally conceded to be the ideal location for an orchard, I am disposed to look

Digitized by Google

farther for the cause, and this is my explanation. The season of 1909 being an off year with a light crop, the trees made a very vigorous growth, and the wood was not well ripened; so when the freeze of April, 1910, came, it not only killed the blossoms but injured and in many cases killed back the entire growth of the previous season, and in consequence they made a feeble growth last year; and while they again blossomed profusely and apparently set a good load of fruit, it nearly all disappeared at the first drop, and the remainder was so scarce and poor that no further spraying was attempted and that which remained to maturity was of inferior quality. The remainder of the orchard, consisting principally of Wealthys, slopes to the south and east, and a bountiful crop of good quality was harvested, the extremely large size and very high color of the fruit being remarkable here as well as in several adjoining orchards of similar location.

One MacMahon tree, shown in illustration, which was photographed when in blossom, deserves particular mention. From this tree eighteen bushels of No. 1 fruit was picked after a wind storm had caused more than seven bushels to drop, most of which was saleable.

Plums yielded a heavy crop, and the size and quality was superior. All small fruits were so near a failure that the results are not worth mentioning. This was particularly the case with raspberries and blackberries. The vineyard again yielded a fair crop, and owing to the hot summer the fruit was perfectly ripened and the flavor of a superior quality. The commercial varieties grown are principally Concord and Worden, but a dozen other kinds fruited and proved more or less worthy of cultivation. Of these I have branded the Beta the poorest in quality. This vineyard has had absolutely no winter protection during the last five winters, and the standard varieties are perfectly hardy. I would not on this account condemn the Beta for locations where the Concord winter-kills, as I believe it is as hardy as the native wild grape.

Of the bundle of trees received from the University Farm, all of the plums and hybrids lived and made good growth, likewise the Hibernal and Soulard crab trees, but both the King David and Delicious apple trees failed to make a start, having apparently been kept too long in storage. The two Carrie gooseberries also failed to make a live of it, as they were far advanced, and the weather hot and dry when received. I also desire to acknowledge receipt of a half dozen trees of Evelyn, four of which lived. These were the gift of the originator, A. B. Lyman, and will be reported on from time to time.

Digitized by Google

Madison Trial Station.

M. SOHOLT, SUPT.

The first trees for trial at this station were set out in the spring of 1908, most of them being the Prof. Hansen hybrid plums. These trees have made a splendid growth. The Sapa, Hanska, Opata and most of the seedlings bore an abundance of the nicest and largest plums I have seen grown in this part of the country. Also the Prof. Hansen cherries, which I budded last year; the branches of these small trees were loaded with some very good fruit.

I also had a good crop of Compass cherry. This cherry makes very good sauce.

Foreground of Madison Trial Station.

Of the following trees I received last spring all are living and have made good growth, with the exception of one Skuya, one King David, and one Gould crab. These are growing: two Sapa, one Ezapaten, two Tokyo, one Stanapa, two Opata, one Sansota, one Cheresota, two Delicious, one King David, three Hibernal, two Gould crab.

We had a good crop of apples and an excellent crop of plums. The Wolf, Wyant, DeSoto, Cheney and Surprise were the most heavily loaded with nice, large fruit.

The scions of the Lowland raspberry, King David and Delicious, which I received last spring, from the experiment station, are mostly all growing.

The Agawam, Concord, Worden and Beta gave a fairly good crop. The strawberry plants which were mulched between the rows gave a medium crop. Dakota No. 1 gave a good crop without any mulching. As you all know, it was one of the driest springs and summers we have had for many years.

Digitized by Google

Right here I wish to state that I had good success with my vegetable flowers and nursery stock by keeping up a continual dust mulch; that is, we kept the hand and horse cultivator in constant use.

Raspberries were a fairly good crop here. Among the bushes I find that the Anthony Waterer althea, will not stand the winters here. The golden elder freezes down every winter but grows up every spring and makes a handsome bush.

We had an abundance of rain this fall, so there is plenty of moisture in the ground, and I think the trees have gone into winter quarters in very good shape.

(N. B. The remainder of the Trial Station Reports will appear in the April Number.

Garden Helps.

(Continued from page 117)

The manure for the hotbed—as fresh as possible—should be gathered into a pile, when, if moist, it will generally begin to heat, no matter how cold the weather. If it does not do this readily, pour two or three pails of hqt water into the middle of it. When the heating has begun, the pile should be turned over, throwing the outside to the center and breaking up all lumps. In a few days it will heat again, and then is the time to put it into the frames.

Clear horse manure heats too violently and should be mixed with an equal quantity of straw.

It should be spread as evenly as possible over the whole surface of the hotbed, filling well in the center, where it will settle the most. It should be packed and tramped down well. Then put on the sash until it heats well. If it does not do so quickly enough, pour on more hot water and cover again. When well warmed through, cover with six to eight inches of soil and again put on the sash and wait for it to warm through and the weeds in the soil to sprout. Then remove the sash and work the soil over until very fine, when it is ready for your flower seeds. A hotbed made in this way will give off heat for five or six weeks, when it becomes a cold frame.

Hotbeds require more water than cold frames and more care in ventilating, it being necessary to watch them carefully, especially on bright warm days, that they do not get too dry and hot. The sash can be raised more and more as the weather warms, and thus the little plants will be hardened off ready for transplanting into the open ground.

If one has a cellar window on the south side of the house, a frame can be put right up to the wall of the house, and the window into the cellar removed. The heat from the cellar with that of the sun through the glass sash will force seeds nicely.

Digitized by Google

THE HOME GARDEN

Seasonable Notes for March

By H. J. BALDWIN, NORTHFIELD

A short talk on the subject of seeds for the home garden ought to be of interest just at this season of the year. How and what shall we choose among the multitude of kinds advertised by our seedmen?

We say *how* shall we choose when each fellow has the best there is without question, and every kind is just as good or better than the rest. A little study will give us some information that ought to be valuable.

Our best seedsmen raise but few of their seeds, but buy them from far and near; our best radish come from France, choice peas from England, beets from Germany, cauliflower from Denmark, many of the small seeds are grown in California; peas come largely from Colorado and Michigan. The irrigated lands produce a high grade of clean, bright seeds. No doubt it is best for us to grow our own corn, and many of the seeds can be easily raised and perhaps more cheaply than we can buy them.

An abundance of seed should always be provided, as often heavy rains or cut worms or other pests make it necessary to plant over several times. Make a study of the longevity of seeds, or the germination qualities of seeds at different ages. A few tests will be all we will have room for in this article.

Tomatoes have been known to germinate 75 per cent at fourteen years of age; turnips fifty per cent at twelve years; squash, cucumbers and melons are all good for four or five years; radish two to three years; parsnips of no worth after one year old. Onions will germinate fifty-six per cent at two years—the same seed may test eighty per cent at one year. Peas are good for three years, lettuce good for four or five years, cabbage about seventy per cent at four years; carrots, one year sixty per cent, two years thirty-five per cent; beans ninety-eight per cent at three years. These figures are from tests made of many samples.

Much depends on the care of seeds. A cool, dry place is best; moisture hurts the germinating quality very quickly.

As to different varieties of vegetables, there are many desirable kinds for the home garden that are not suited for the market gardener. Allow me to name a few of the kinds I hope to plant this year. Wax beans, Davis and Black Wax, with Horticultural for a shell bean; beet, Detroit Red; cabbage, Early All-Head and Holland, or Ball Head, for late; carrots, Danvers half long; cauliflower, Snowball; celery, Snow-white and Pascal: cucumbers, Chicago Pickle; sweet corn, Carpenter's Golden as best yellow; Golden Bantam is good but smaller and not so healthy; Evergreen, Country Gentlemen, and for real late, more of C. Golden; lettuce, Grand Rapids and Tennis Ball; muskmelon, Tip Top and Ohio Sugar; watermelons, Peerless or Ice Cream; onions, Red and Yellow Globe; peas, American Wonder, Imp. Stratagem, Carter's Daisy and Potlach; radish, Scarlet Globe for hotbeds, Icicle, Ne Plus Ultra and Globe for outside planting. Hubbard squash; tomato, 1st, Early June Pink, late, Ponderosa, Globe and Stow. Always try just a few of the new varieties; many of them prove worthless or are only an old variety with a new name.

Be sure and provide a good tight box with a number of partitions in it, using care that no mice can get in, and if each partition is labeled you can always place your hand on the package of seed wanted without delay. As the seed is purchased, make an effort if possible to find out the year in which the seed was grown and mark it plainly, then as you look over your old seeds you can judge if they are of any worth. Poor seed is a curse to any man. Our April number will find us busy planting the hardy seeds and caring for the hotbeds.

Digitized by Google

GARDEN HELPS

CONDUCTED BY

The Minnesota Garden Flower Society

(Formerly The Minnesota State Rose Society)

Edited by MRS. E. W. GOULD, 2644 Humboldt Avenue So., Minneapolis.

NOTICE

The next meeting of the Minnesota Garden Flower Society will be held in the Directors' Room of the Public Library, corner Tenth Street and Hennepin Avenue, Minneapolis, on Wednesday, March 13th, at 2:30 o'clock.

PROGRAM

Rose Culture	Mr. Chas. Nordeen, Lake City
Shrubs	Mr. A. Phelps Wyman, Minneapolis
Question Box	Come and bring your friends along.

COLD FRAMES AND HOTBEDS—No one who has once enjoyed the convenience of a cold frame or hotbed would willingly do without one or the other, and either can be made inexpensively at home.

The cold frame is more simple than the hotbed. By this term we mean a frame covered with glass sash and used to protect plants in winter, or for increasing their growing period without other heat than that of the sun. The usual size is four and one-half to six feet wide, and of any length desired. For home use a storm sash that is not in use, or that can be spared, can be used and the frame made to fit it. It is best to locate this so that it will be protected from the north and west, and it should slope to the south. The frame should be six inches above the ground on the north side, and one inch above on the south side, thus giving a slope of five inches. The box should extend a foot or more below the level of the ground. The earth inside the frame should be thrown out and banked against the sides on the outside. Get the best soil you can for the inside of the frame, and then it is ready for use. The cold frame needs to be ventilated on mild days and covered with sash and mats on cold nights and days.

For forcing plants in the spring hotbeds will be found more satisfactory. A hotbed is like a cold frame but is warmed by fermenting horse manure or other material placed under the soil, and so it must be dug deeper to make room for it. The amount of manure required to warm a hotbed depends largely on the season of the year it is used. In our climate when made in March from twenty-four to thirty inches of manure will be required, covering it with six or eight inches of rich soil. Later in the season, twelve to eighteen inches of manure will be enough.

Both hotbeds and cold frames for spring use are best prepared in the autumn. The earth can be put in the cold frames, then covered with leaves, sash and mats to keep out the frost, or it can be taken into the cellar and stored in boxes ready for early use,

(Continued on page 115)

Digitized by Google

Advance Premium List, Summer Meeting, 1912.

OUT-DOOR ROSES.

	1st prem.	2nd prem.	3rd prem.	4th prem.
Collection—three blooms of each named variety, to be shown in separate vases	$10.00	$6.00	$3.00	$1.00
Collection of named varieties—three blooms of each, in separate vases, amateurs only	10.00	6.00	3.00	1.00
(The prizes as above, amounting to $20, contributed by Mrs. Jessica DeWolf, St. Paul, and Mrs. J. M. Underwood, Lake City.)				
Three named varieties, white—three to five blooms of each, in separate vases	2.00	1.00	.50	
Three named varieties, pink—three to five blooms of each, in separate vases	2.00	1.00	.50	
Three named varieties, red—three to five blooms of each, in separate vases	2.00	1.00	.50	
Collection of Rugosa and Rugosa hybrids, three to five blooms each, in separate vases	3.00	2.00	1.50	1.00
Most beautiful rose in vase—Bronze Medal donated by American Rose Society.				
Largest rose—in vase	1.00			
Seedling rose	3.00	2.00	1.00	
(To be shown by originator)				

The following named varieties of roses to be entered separately and shown in separate vases, three to five blooms in each vase.

Prince Camille de Rohan, General Jacqueminot, Margaret Dickson, M. P. Wilder, Jules Margottin, Magna Charta, Paul Neyron, Madam Gabriel Luizet, Baroness Rothschild, Anna de Diesbach, Ulrich Brunner, John Hopper, Rosa Rugosa (pink and white), Baron de Bonstetten, Karl Druski, Madam Plantier.

Each—1st prem., 75 cents; 2nd prem., 50 cents; 3rd prem., 25 cents.

PEONIES.

	1st prem.	2nd prem.	3rd prem.	4th prem
Vase of Festiva Maxima 6 blooms	$2.00	$1.00	$ .50	
" " light pink "	"	"	"	
" " dark " "	"	"	"	
" " white "	"	"	"	
" " red "	"	"	"	

	1st prem.	2nd prem.	3rd prem.	4th prem.
Collection—three blooms of each variety in separate vases	$8.00	$6.00	$4.00	$2.00
Collection—three blooms of each variety in separate vases, amateurs only	6.00	3.00	2.00	1.00
Seedling peony, three blooms	3.00	2.00	1.00	.50

ANNUALS AND PERENNIALS.

	1st prem.	2nd prem.	3rd prem.	4th prem
Vase of Iris, each	$2.00	$1.00	$ .50	
" " Delphinium "	"	"	"	
" " Sweet William "	"	"	"	
" " Lilies "	"	"	"	
" " Sweet peas "	"	"	"	
" " Canterbury bells "	"	"	"	
" " Foxgloves "	"	"	"	
" " Shasta daisies "	"	"	"	
" " Iceland poppies "	"	"	"	
" " For-get-me-nots "	"	"	"	
" " Perennial Coreopsis "	"	"	"	
" " Pansies "	"	"	"	
" " Gaillardias "	"	"	"	
Collection—named Perennials, in separate vases	$7.00	$5.00	$2.00	$1.00
Collection—named Annuals, in separate vases	7.00	5.00	2.00	1.00

Digitized by Google

SECRETARY'S CORNER

THE HOME GARDEN.—By urgent request of the secretary, Mr. H. J. Baldwin, of Northfield, Minn., has consented to conduct a department during the current year in our monthly under the title of "The Home Garden". Mr. Baldwin has had a large experience as a grower of vegetables for personal and market uses. His advice is reliable, and we are sure will be appreciated by our readers.

BLACK WALNUTS FOR SPRING PLANTING—Mr. Martin Penning, of New Ulm, Minn., writes that he has two bushels of Black Walnuts in good condition for planting this spring. They are not dry and are all right, he says. He will sell them for fifty cents per peck, express I presume to be paid by the purchaser. As these walnuts have ripened on hardy Minnesota trees they would be valuable seed for any one to use who wishes to secure some trees of this kind.

UNPAID ANNUAL DUES.—If you find a pink slip bound in with this number of the magazine, between the front cover and the first page, and read it over, you will note that your annual membership fee for the year 1912 is not yet paid. Please make payment as promptly as possible, not forgetting that you are entitled to two lots of plant premiums, which must be selected, however, before Apr. 1st, that being the limit allowed for these valuable plants sent out for experiment purposes to our members.

THE ANNUAL MEMBERSHIP ROLL.—Memberships have come in with unexpected rapidity, and the roll at present stands 300 more than last year at the same time. The farmers' institutes have not done as much as heretofore for various reasons, but the members of the society have done more. We have reasonable hopes that our ambition of an increased membership roll this year will be realized.

Dear fellow member, have you yet sent in the one new name that we are looking to you for?

NO APPLES ON PLUM ROOTS.—If a nursery agent approaches you with a proposition to sell you hardy apples grown on plum roots turn him down very hard. Such a proposition is being made here in Minneapolis and perhaps in other parts of the state. Apple trees do not grow on plum roots; it is an absurdity, an impossibility. If you can get apple trees grown on apple roots raised from hardy varieties of apples, Minnesota seed, it is well to do so, or even grafted upon crab roots, but on plum roots—there is no such thing!

NO INJURY TO HARDY APPLES.—The extraordinarily severe weather of the winter made it possible that semi-hardy varieties of apples which are being planted in considerable quantity in the state—to much larger extent than they should be—would show injury, but reports received in the office do not indicate any injury whatever to such varieties as far as we have heard. It is early yet, however, to be positive as to final results, and reports received a month from now will be much more reliable. It is not believed, however, that any varieties of apples of that class which we term hardy apples are in the least injured.

Digitized by Google

WILL YOU PLANT APPLE SEED?—The secretary has a considerable quantity of Wealthy apple seed grown in the orchards about Excelsior for distribution to the members at the old rate of ten cents per packet, but as there is a considerable supply on hand the amount sent out will be double that of last year; fifty seeds will be sent. There is also a small quantity of seed from the Anisim and Patten's Greening. Purchasers will be accommodated with the variety they ask for as far as possible. We hope a considerable amount of planting will be done this spring in connection with the seedling apple prize offer, particulars of which are spoken of briefly in the folder, and will be found described in full in the Februrary, 1912, Horticulturist.

FREE DEMONSTRATIONS IN PRUNING, TOP-WORKING, ETC.—The Horticultural Specialist with the Agricultural Extension Division, St. Paul, is preparing to conduct demonstration work in pruning, top-working, spraying, in the various sections of the state this coming season. Any community that wishes such work done may now be scheduled for it by writing to the Extension Division at the above address. The only requirements are that the person wishing the work done invite his neighbors in on the day on which the specialist will be there to see the operations performed. There will be no expense to the community whatever. It is very desirable that the applications be received at an early date in order that the schedules be arranged to facilitate traveling to and from the various points.

TREES FOR TOP-GRAFTING.—The extraordinary offer of six trees to be used in a top-grafting experiment, made in the February Horticulturist, is repeated in this number in the same place in the magazine; that is, on the inside of the back cover. Only a small proportion of the whole amount offered has yet been asked for, but as it is an especially valuable offer there is no doubt that the full number will be eventually taken. Do not put off the opportunity of securing this premium for yourself or for your neighbors, any one of whom if interested in fruit growing would appreciate it and should derive great practical benefit from it. The successful and enduring orchards of the Northwest are undoubtedly to be grown by top-grafting on hardy stocks. If you give this extraordinary premium of six trees to a new member he will also be entitled to the report of the society, magazine and two plant premiums, or you may keep the top-grafting premium yourself for your trouble in securing the member. We want to get on our membership roll the names of all persons really interested in the fruit development of the state.

FRUIT GROWERS' CONVENTION.—On February 9th, a committee comprising Mr. A. H. Barnard, Crystal Bay; Mr. H. U. Beebe, Lake City; Mr. Emil Sahler, Waseca; Mr. Langford W. Smith, St. Paul and Mr. K. A. Kirkpatrick, University Farm, appointed at the recent meeting of the State Horticultural Society, met in Minneapolis and drafted the constitution for a central fruit marketing association, to be known as "The Minnesota Fruit Association." The committee decided to call a general meeting of the growers of the state to convene at 10:30 A. M., March 11th, in the Horticultural Building, University Farm, St. Paul, to consider a constitution, elect a board of directors and complete the organization. An interesting program has been prepared for the day by the Horticultural Department, and the meeting will undoubtedly be a time of profit to all attending.

The records of associations already formed show that organization is the only profitable solution of the marketing problem. A central marketing association to which individual isolated growers may belong will help not only them but will increase the efficiency of all local associations many fold. Growers over the state and representatives of all local associations are urged to be present at this meeting. Write the Horticultural Department, University Farm, St. Paul, for a program and further particulars of the meeting.

Digitized by Google

Digitized by Google

LAKE KORONIS, ONE OF MINNESOTA'S BEAUTIFUL LAKES, ADJOINING PAYNESVILLE TRIAL STATION, STEARNS COUNTY, MINN.

Digitized by Google

☞After reading this magazine, will you please pass it along to some friend who will appreciate it and whom you may perhaps interest to become a member of the society—at least he should derive benefit from its reading. By distributing in this way the twelve magazines received during the year 1911, at the beginning of the next year, upon renewing your membership in the society you will be entitled to receive postpaid a cloth bound volume containing all the magazines for 1911 and much other interesting matter, with a full index of all its contents, entitled "Trees, Fruits and Flowers of Minnesota," a handsome book for your library and invaluable for reference.

THE MINNESOTA HORTICULTURIST

Vol. 40. APRIL, 1912. No. 4.

TRIAL STATIONS, 1911.

(Concluded).

(Reports presented at the annual meeting of the Society. Dec. 7, 1911.

Native Shrubs and Trees at the Montevideo Trial Station.

L. R. MOYER, SUPT.

Our northwestern landscape gardeners are becoming more and more convinced that greater attention ought to be given to the possibilities of using in our park and border plantings our native shrubs and trees. Our native American elm (Ulmus americana) is our standard street tree, and in our western prairie towns is replacing the box elder (Acer negundo), formerly so much planted. In the Northwest the elm has as yet few insect enemies. But the box elder has been exploited too much. To be sure, it grows very fast when young and is then quite attractive; but it ages rapidly and soon becomes a decrepit looking object. It has the habit of dropping many of its leaves in June, so it litters up the lawn. Its leaves are naturally of a yellowish green and do not give the deep, dark effect that is in many ways so desirable in park planting. But because it is so easily grown, and makes such a good account of itself from the start, it is still much used. A few years ago it became much infested with a sort of aphis and with the box elder bug, seemingly a protest on the part of nature against the inordinate planting of this tree.

The wild plum (Prunus americana) is a common large shrub along the borders of timber land in this neighborhood. Varieties of this plant have been planted on nearly every farm, and with the stopping of prairie fires the plum shrubs started up on the borders of timber everywhere, and nature, which delights in preserving a proper balance, sent the plum rot, so that there were no good plums for several years. Then came the early spring of 1910 when the plums

Digitized by Google

bloomed some three weeks before their proper time, and after that a frost that destroyed the plum crop. But the frost was a blessing in disguise for the plum rot was destroyed, and this year we had a good crop of plums.

Our native green ash (Fraxinus pennsylvanica lanceolata) is considerably used for prairie planting with good results; as well as hackberry (Celtis occidentalis). In Montevideo the cork elm (Ulmus racemosa) has been planted with much success. It is a sturdy tree with something of the aspect of a bur oak.

Another native tree is the coffee tree (Gymnocladus dioicea), and it is succeeding very well on the prairies where there is some shelter.

Perhaps the earliest native shrub to bloom is the buffalo berry (Shepherdia argentea), but the flowers are very inconspicuous. The red berries, combined with its silvery foliage, make the shrub an interesting object in August.

Another native, the red-berried elder (Sambucus racemosa) blooms very early; in fact the buds show signs of opening in the fall. The red berries are very showy, but in this neighborhood they are eagerly sought by the birds, and so do not last long.

Another very early native shrub to bloom is our Juneberry (Amelanchier oblongifolia or a closely related species). The young leaves and racemes are silvery tomentose at the time of blooming and combine so well with the white flowers as to make the shrub a very striking object. In growth it is very upright, and toward the end of June its bluish purple fruit is good enough for any one to eat and is eagerly sought after by the birds. The form that we have does not seem to be exactly described in any of the botanies. The Juneberry does finely in cultivation.

Our native sheepberry (Viburnum lentago) is one of the most beautiful shrubs that can be planted in the border, unless it be the cranberry tree (Viburnum opulus americana). A closely related species from Asia which we have as Viburnum pekinensis shows glorious color effects when its foliage is toughened by frost in autumn.

Out at Mobridge on the Missouri river, in South Dakota, the golden currant (Ribes longiflorum) grows wild, although it has long been an inhabitant of old-fashioned gardens, probably having been imported by the early settlers from England. It was first discovered by Lewis & Clarke almost 110 years ago, but the name now applied to it was given by Thomas Nuttall, the great English botanist, who named so many western plants. Being a native it is needless to say that the golden currant is a desirable shrub in the hardy border. Like

Digitized by Google

the garden currants, it is subject to leaf rust and should be sprayed with the lime-sulphur solution when the other currants are sprayed.

In rich, moist locations where there is some shelter one can grow the sugar maple (Acer saccharum) and the silver maple (Acer saccharinum); but neither succeed very well on an open, wind-swept prairie. Give them plenty of room, and they will give a good account of themselves.

Of all our northern trees the basswood (Tilia americana) is perhaps the most beautiful and picturesque. It is possible to have it even on the prairies, where there have been other trees planted to give it shelter. Do not try to train it up to a single stem, but let the sprouts grow and treat it as a shrub. It will need good cultivation at first and plenty of room, where other trees have not exhausted the soil moisture. When well established violets and wild woods phlox may be planted under it, and they will need no care except the pulling up of encroaching weeds.

The white spruce (Picea canadensis) seem to be failing here. The tree is indigenous to our northern border, extending northward almost to the Arctic Ocean and even to Behrings Straits. Whether it is lack of sufficient rainfall or whether the rich, calcareous soil of southwestern Minnesota contains too much lime for it is uncertain, but it is quite apt to fail after attaining some age. Perhaps our trees were damaged by the coal smoke from a mill not far away, and from the railway yards and the roundhouse. It seems altogether likely that the Black Hills spruce will be found to belong to a different species. A considerable planting of it made here in the cemetery is giving much satisfaction. The Colorado blue spruce (Picea pungens) is full of promise for a long life and stands at the top of the list for prairie planting.

It is perhaps impossible to change the common name of any tree, and we shall always perhaps speak of the course, rugged pine from the foothills of the Rocky mountains as bull pine. But the name seems to be in bad taste; and why should we not speak of it in our horticultural writing as Rock pine, which is a translation of its Latin name as now understood, Pinus scopulorum. Of its hardiness there is no question, and it seems to be pretty well adapted to the prairies.

The only really indigenous evergreen to this neighborhood is the red cedar (Juniperus virgineana), and of course it is hardy. The cedar apple (Gymnosporangium) has not been very noticeable here; but this year the cluster-cup fungus was found on the leaves of the Wealthy apple trees. It is well known that the winter host of this

Digitized by Google

fungus is the red cedar trees, where the cedar apples are produced.

Our native plum (Prunus americana) has become an orchard fruit to such an extent as to make us overlook its desirability as a border shrub. It needs much pruning when thus used in the way of cutting out dead branches, but that is the case with all shrubs. Even more ornamental is the Canada plum (Prunus nigra) with its large red fruit. It grows wild about Winnipeg and is said to be the parent of the Cheney and the Aitkin.

One who has a large border cannot well neglect the choke cherry (Prunus virgineana). It will take care of itself with little encouragement and is interesting both in bloom and fruit; while its leaves, shining green on the upper surface and whitened on the lower side, give it a different aspect with every passing breeze.

The wild red cherry, or pin cherry (Prunus pennsylvanica), is one of our most beautiful pendulous-branched trees. It never attains great size and thus may be used in grounds of comparatively small extent. It forms a well shaped head and, as it grows here, is decidedly "weeping," if that term may ever be appropriately applied to a tree.

Our native hawthorn (Crataegus rotundifolia) makes a beautiful round-topped tree, interesting both in flower and fruit. In other parts of the state there are other hawthorns, some of them quite large fruited, all well adapted to cultivation. Most of them have a bright red fruit.

Our native wahoo (Euonimus atropurpureus) is worth cultivation too for its bright autumn fruits. The closely related bitter-sweet (Celastrus scandens) is one of our best hardy climbers.

For moist places some of our native willows possess merits that have been greatly overlooked. The pussy-willow (Salix discolor) grows as far southwest as Montevideo and blooms so early as to be celebrated in poetry and legend. Our native cornels (Cornus sanguinea and Cornus Baileyi) are equally suited for moist locations and have the merit of blooming all summer.

In southwestern Minnesota we have only the smooth sumach (Rhus glabra), but it is a beautiful shrub, almost as attractive as the stag-horn sumach and surely worth a place in the shrub border.

IT is needless to say that the care of spraying machinery should never be neglected. The man who pays $400 for an outfit cannot well afford to let it stand out over winter where metal parts will rust, where the tank will dry out and deteriorate if it is a wooden one. Too often, gasoline engines are ruined because water is left in the cooling jacket until cold weather comes on. It freezes there, and the engine is useless until another cylinder is purchased.

Digitized by Google

Nevis Trial Station.

JAS. ARROWOOD, SUPT.

Trees of all descriptions came through last winter in good shape without loss. The apple crop was short on all grafted stock. Seedlings that were in bearing bore heavily, fruit was usually small but of good quality; 1910 was too dry to set fruit buds. The plum crop was a big one and the cherry crop also. We have about fifteen hundred trees of all ages.

Grapes were good. We have about three hundred young vines. Raspberries and gooseberries were not very heavily loaded. Straw-

Seedling plum tree. three years old, hand pollenized—bore one peck. Mr. Arrowood standing beside it.

berries were a good crop. All trees that were received from the Central station grew and did well except one King David and one Senator died. The stock received from Prof. Hansen's nursery grew and did well. All stock went into winter quarters in good shape. The ground has plenty of moisture, and there is a good snow mulch to preserve its moisture.

We have some new varieties that we will send to the trial station this spring for trial purposes.

Crops of all kinds and garden stuff also were good.

Digitized by Google

Owatonna Orchard Trial Station.

THOS. E. CASHMAN, SUPT.

Nearly every tree that is old enough to bear fruit in the Owatonna Experiment Station bore a large crop the last season; in fact, the trees bore too heavily to produce large fruit, but the apples were free from scab and all other diseases which they are heir to. This was due to the spraying campaign which we have been carrying on for a number of years, including the present season.

Will state here that there is no question but what judicious spraying will destroy nearly all insect pests and fungous diseases which attack our Minnesota fruit. The careful observer can readily select fruit that has been sprayed regardless of where he may find it. This is particularly noticeable at our fairs.

A year ago, I reported that I intended to lay in a supply of orchard heaters and crude oil so as to be prepared to save the apple crop from destructive frosts in the spring. Will say that I did purchase these last winter and was prepared to keep the orchard warm, unless the thermometer should drop below sixteen degrees above zero.

I instructed our night man to call me should the mercury drop below thirty-five during the night. I received but one call during the spring, which was about as follows: "Tom, you better get out the boys. The thermometer now registers 35 and is falling fast." This was about 3:30 in the morning in the month of May. I do not remember the exact date. I told him to get out the boys, and I would be there to engineer the job. Inside of thirty minutes, we had a team hitched to tank, previously loaded with crude oil and 500 orchard heaters, which are like large dripping pans with covers, on a trot to the orchard with half a dozen men on the run following the team.

The plan was so well carried out that in a very short time we had over 200 fires started, and the thermometer, which we hung on a tree, showed signs of going up. The facts are that it did not freeze that morning, but the demonstration and drill that our men got out of it was worth far more than it cost, for I satisfied myself as to what could be accomplished should necessity arise.

To give you an idea of how we carried out this work: Two of the boys started on the run between the rows of trees, with as many pans and covers as they could carry and dropped a pan and cover midway between the rows and opposite every other tree. I believe this to be about the right distance to set the heaters where trees are planted sixteen and a half feet apart. Two other men followed with buckets of oil and poured about a gallon of oil into each pan; another

Digitized by Google

man followed who placed the covers over the pans, leaving two inches of an opening at one end; this same man also dropped a small piece of waste into the opening of the pan, submerging part of it in the oil, which served the purpose of a wick; another man followed with a torch who lit each wick which instantly ignited where sufficient waste was allowed to hang over the pan and well saturated with oil.

The oil we used is known as Kansas distillate, which we buy in car load lots f. o. b. Owatonna at 4.15c per gallon. We did not buy this distillate for orchard heating purposes, as it is a commodity we use for fuel in our tractor engine, and we always have a supply on hand. I believe a much cheaper grade of oil could be used for heating purposes, and the expense is so slight that no one having an orchard that is worth anything can afford to take the risk of having the blossoms frozen.

During the fall season we have more than sufficient moisture to carry the trees into winter in good condition, and we need have no fear of root-killing, provided each tree is properly mulched. Freezing and thawing in winter makes mulching necessary if we wish to guard against root-killing in Minnesota.

Paynesville Trial Station.

FRANK BROWN, SUPT.

The policy of this station during the year 1911, as in the past, has been a strictly trial work, leaving to other hands the work of discovering new fruits and flowers.

In this part of the state the present season has been one of the best for fruits of nearly all kinds that has ever been known in the history of fruit growing in this locality.

Strawberries were perhaps an exception this season, but we notice that where proper care was given they too gave generous returns.

In the spring of 1910 we procured from Prof. Hansen several of his Gold plum and apricot crosses, among them the Opata, a cross between the Gold plum of California and the sand cherry. The trees made a fine growth, setting fruit buds freely. This season one tree, two years from the bud and once transplanted, bore ten specimens of large purplish-red plums that for size and flavor would do credit to any station in the Union. These plums were fully ripe before August 1st.

Another of these trees, the Inkpa, an apricot cross, also bore fruit. This is a cross of the apricot-plum of China and the wild plum of Min-

Digitized by Google

nesota. The fruit is large and good in every way, with a decided apricot flavor.

These trees are all the same age (two years), have made a splendid growth, seem perfectly hardy and are covered with fruit buds for another season.

A full line of Prof. Hansen's new fruits was sent from the State Experiment Fruit Farm to this station the spring of 1911. Of this lot but one was lost, the Etopa; the balance are in splendid condition and, I believe, without exception covered with fruit buds. The most of these trees made a wonderful growth the past season; one, the Opata, made a growth of over four feet on one branch, and others did nearly as well.

A number of grafts of the Delicious apple were sent us last spring also from the fruit farm; they were top-worked on Hibernal trees. An examination shows the union to be perfect and a very satisfactory growth. This work will be looked after with much care in the future at this station. We have in contemplation the planting of a number of acres with stock suitable for top-working in connection with the other station work.

It seems as though we had a new surprise every day. During the plum season all kinds bore well, but the Wastesa easily led them all. It is an annual bearer; the fruit is with one exception the largest of all with us, and the lady of the house says it is the richest for canning of all the plums we grow.

The Huya plum (Prof. Hansen's) bore very heavily this season. It is the largest of all and, although somewhat late, bids fair to be useful at least in some locations.

The Sunbeam raspberry is still a favorite as an all around berry for everybody. It is robust and hardy and is not subject to disease, as some of the weaker varieties are.

There is growing on our grounds a strawberry that promises much for the future. We have failed so far to trace its origin, but as far as we have been able to we find it a sport from an eastern variety. For the past two winters it has stood entirely uncovered, especially the winter of 1910-11, not even snow to cover it, and still it has produced heavy crops of berries where other varieties, well covered, produced nothing. It has a perfect flower and is a good plant maker. Of course, like many other things, it will stand coddling but does well without it. We call it Koronis, after our beautiful lake of that name, and, like it, consider it the finest of its kind.

Pruning is a subject in which we are much interested here at the station. Your superintendent (although originally from the state of New York, where they prune, cut and slash their fruit trees to get the

Digitized by Google

best results) had got the idea firmly established in his head that a Minnesota fruit tree should not be pruned excepting cross limbs, etc., but results from pruning in our own orchard have given that idea a severe jolt.

During the winter 1910-11 we pruned a part of our trees severely, with this result: The trees set more fruit, retained more fruit and ripened more fruit than trees of the same variety not pruned, and as this experience has been repeated over and over by ourselves and others, we are grinding our pruning shears and getting ready for business. Will tell you the results later.

I can almost see our secretary's shears coming—so must close; but must say that horticultural prospects never looked as rosy as now. Like the unrolling of a scroll, new things are coming to us every year, and all old things are growing better. So let us press on to as near perfection as possible, believing that "He that is faithful in few things shall be made ruler over many."

Trees, fruits and flowers, with grand old Minnesota soil and climate! What more could we ask?

Sauk Rapids Trial Station,

MRS. JENNIE STAGER, SUPT.

The spring of 1911 commenced with the ground (which, on account of the lack of rain in the fall of 1910 was not frozen to any great depth) sucking in the rain that fell, and yet when worked being found dry after passing through six or eight inches of soil (clay). Plum and apple trees around which, after coming from the teaching of the winter meetings, I had heavily manured, leaving a depression in the middle and into which we poured six pails of water to each tree, blossomed quite early, so much so that several times in the wee sma' hours of the morning we turned out from our comfortable beds and, shivering and execrating the untimely frosts, set fire to the mounds of straw left in position for that purpose, thereby saving, as we thought, the blossoms from being destroyed from the frost, and thereby getting a wonderful amount of fruit from the number of trees planted. So far we have had only one tree blighted in the orchard, and that we immediately cut down and burned.

We were perfectly sure we were going to have a large crop of fine strawberries on uncovering them late and seeing their condition, but others as well as myself around here only succeeded in getting about two or three pickings; then they suddenly dried up. On investigating we found the ground dry for a foot or more.

Digitized by Google

Raspberries and currants were in the same condition, and gooseberries only gave about a third of the amount of fruit we were in the habit of getting.

But one disadvantage, the ground here is sloping, so we got no appreciable good from the small amount of rain that fell. Our Russian mulberries died out entirely, as did the Carolina poplars, Lombardy poplars and most of the mountain ash.

Lawn scene at Mrs. Stager's.

Of evergreens, those that were taken up and sent here from Brainerd all died, while Scotch pine, Norway spruce, Colorado blue spruce, balsam, fir and hemlock (seedlings many years ago) that came from Hill's evergreen nursery and the State Experiment Farm all came through O. K.

We tried several new kind of potatoes last spring. From New York the Bartlett, Big Ben and Noxall. The Bartlett gave the largest and best looking, and the Big Ben the largest quantity for the amount planted. Then we had some perfectly enormous ones from the Bitter Root Valley—the kind the Northern Pacific uses in their dining cars. Here, however, they were not so large; still a very good size, the difference being likely in the soil, as I was told the soil there is like pulverized lava. And last but not least we planted some of Sir Walter Raleigh, sent out for trial by the Central Station. They were planted in an old raspberry field that had been formerly well manured, one eye to a hill, and when we harvested them! Oh, my! Oh, me! They beat the crowd for sizes and number in the hills and not one small one.

Digitized by Google

Our peonies budded beautifully, but after a day or two of picking one night we left them in their glory. The next morning they were dried and drooping on their stalks. All of our spring and summer flowers suffered from the drouth, but later, on account of the delayed rain making its appearance, the asters and other fall flowers flourished wonderfully.

Asteroides boltonia, a new premium sent out by the Central Experiment Station, was literally a mass of long-stemmed, large white daisy-like flowers, with dark centers. Coming so late in the season it will fill a long felt want.

Then the dahlias—we cut and cut them, and still they flowered, and even after the night frosts came for over a week each morning we found them as full of blossoms. So on the whole we have nothing to complain of.

West Concord Trial Station.

F. J. COWLES, SUPT.

A very successful season is at a close so far as growth in trees and plants is concerned, and a bountiful fruit crop has been harvested. The ground being quite dry in the spring, we spent some time in pre-

Gathering the strawberry crop at F. J. Cowles'.

paring the soil before planting, and to this we owe our success in getting a good stand. Especially in strawberry plants our stand was perfect, and the fall rains have given us a good crop of plants. Our strawberry crop was very good. The hot wind just as the plants were in bloom injured some of the blossoms on the Senator Dunlap, which cut the crop short on that variety, but the Warfield produced a bountiful crop.

Our plum crop was much better than we expected the fore part of the season, and all varieties bore well. The Compass bore very heavily; some trees were bearing in the nursery rows. We like this fruit, especially for canning.

Digitized by Google

Our apple crop was very heavy. Peerless were loaded, some trees bearing two or three barrels of perfect fruit, which sold for $3.00 per barrel. We had several seedlings come into bearing this season; one was a red winter crab. Several years ago we set out a row of Virginia crabs in our orchard to top-work, though we have never had the time to do much until this spring. But we were very successful, and this fall we put in a lot of buds in these trees. Our first buds started to grow after the fall rains, and we notice some have grown two or three inches. The wood seems to be quite hard, and as they have shed their leaves perhaps some will come out all right in the spring. Later we put in more buds, which have stayed dormant. We have put a number of new varieties into these trees, such as Delicious,

Apple trees in bearing on the streets of West Concord, Minn.

King David, Lowland Raspberry, Highland Pippin, Milwaukee and a number of other varieties. I think that every one who is interested in fruit growing should know how to top-graft and bud.—it is very easy and interesting work.

Prof. Hansen's new plums that we received from the station have all done well, and we shall watch them with much interest and report on them from time to time. The Herbert raspberry that we received from the experiment station in Canada last spring has done well. We have covered part of them and will see how they winter. The clematis that we received from China has been in full bloom all summer, and we think it is something beautiful.

We wish to emphasize again the apple trees that are on the outside of the sidewalks in the resident part of our town. These surely are a success and are doing well. Most of them bore heavily this year. The varieties to plant are those that are upright growers such as Whitney, Peerless and others of this class. Do not worry about the children destroying the trees. Give the children all the apples that they can eat, and they will not have an appetite for tobacco and liquor.

Digitized by Google

Hybrid Plums and What We May Expect from Them.

DEWAIN COOK, JEFFERS.

It has been the dream of a few of our enthusiastic fruit growers for many years that eventually we would get, by crossing our native plums with the larger and firmer foreign plums, varieties that would be hardy, with larger and firmer fruit than any of the natives.

Many others have looked for improvement in this fruit through the selection of native seedlings, and many fine varieties have thus been produced, and we know that by freely planting the pits of our largest and best native plums and by selecting from them we can multiply those large, fine varieties almost indefinitely. But nature has apparently set a limit; the mandate seems to have gone forth that "thus far shalt thou go and no farther."

And now a large and determined effort is being made to improve our native plums by crossing them with some of the large foreign sorts. Our own state fruit-breeding farm is doing a large amount of this work, and wonderful results have already been accomplished.

Mr. C. G. Patten has been crossing our American plum with Prunus domestica, and has produced several promising varieties of such hybrids.

We have a few promising varieties of hybrid plums, crosses of the American and Japanese plums, originated a dozen or more years ago by Theodore Williams, of Nebraska. Among them is the Emerald, sometimes called Burwood, and the Eureka and the B. A. Q., all apparently hardy and productive.

We all know something of what Prof. N. E. Hansen is doing out at Brookings, S. D. His sand cherry and peach cross has not fruited that I have heard of, but the trees of them I have growing are not promising. I don't think we need expect very much from the sand cherry-peach cross, but we can't always tell. His sand cherry-apricot crosses, so far as the writer knows, are not very promising trees. They kill back quite a bit and fruit scantily. But we may expect something of great value from his crosses of the native plum and the Chinese apricot. These hybrids are represented by the Hanska, Inkpa, Kaga and Toka. They may prove valuable as commercial varieties.

Of sand cherry crosses with the Japanese plums there are many varieties. This is a new class of fruit, of which the Sapa and the Opata are representative. We may expect from some of this class of hybrids some varieties adapted to every person's garden in the northwest; especially in the village gardens, where larger trees would not be desirable,

Digitized by Google

this class of hybrids may be expected to succeed wherever the sand cherry does well.

There is one characteristic of the Japanese varieties of plums that seems to be imparted to about all of these hybrids with the American plums, and that is its habit of forming fruit buds on its growth of the current year, as well as upon older wood and spurs, thus giving them a tendency to not only bear a year or two younger than our American varieties but also to be more productive.

What we have just said regarding the Japanese crosses is also applicable to the American plum and apricot crosses, also the sand cherry crosses.

While the European plum, the Japanese plum and the Chinese apricots are larger than our native plums, they are also not quite so hardy as to cold. We may expect them, and also the sand cherry crosses, to succeed best when grown in a sheltered location.

Mr. Tingley: Did your B. A. Q. fruit this season?

Mr. Cook: Yes, sir.

Mr. Tingley: What is its season?

Mr. Cook: Ripened with the De Soto.

Mr. Tingley: Which is the one that ripens usually before the Forest Garden? Is that the Eureka?

Mr. Cook: I think so. That Opata sand cherry cross was ripe enough for market on the 15th of July and has never gone beyond the 25th of July. It is earlier than any other plum I know of.

Mr. Wedge: I would like to ask Mr. Cook in regard to the sand cherry crosses doing better under shelter. Does not that apply to cherries generally?

Mr. Cook: I cannot say it does. There is one thing about our larger plum, if they are like the Averill—the wind blew mine off before they were ripe, but otherwise I do not see any nicer plums raised in a sheltered place.

Mr. Sahler: Is that not the way to make the Surprise plum tree bear?

Mr. Cook: The best way is to throw it out. I just got a letter from Mr. Penning, who originated the plum, and he said he was going to discard it.

Dr. Speechly (Manitoba): I have the Cheney plum tree in my yard. One of my neighbors came around and said if it did not bear plums I should put a large heap of stones around the tree. Is there anything in that to make a tree bear?

Mr. Cook: Stones make a mulch, but they do not do the tree any good otherwise.

Mr. Emmans: Would you recommend mulching plum trees with leaves? I have two little groves with an abundance of plums, and I have also an abundance of leaves? Would you throw the leaves around the plum trees?

Digitized by Google

Mr. Cook: I don't think it would do any harm unless you put them on too thick. I have killed a few trees by mulching too heavily.

Mr. A. W. Richardson: Don't you think the killing is due to the heating?

Mr. Cook: I don't know. An apple tree will stand a lot of mulching, but I have not found a plum tree that will.

Mr. Martin: Would you recommend a hundred miles west of the Twin Cities, Prof. Hansen's plums?

Mr. Cook: I think some varieties would be more valuable a hundred miles west than they would a hundred miles east. That is, in a good, dry western country, and that is where they originated.

Mr. Beebe: I want to speak a word for the Wolf. If I could pick out one plum that produces more than any other, it is the Wolf freestone.

Mr. Cook: I had some sent me, and they fruited for two years. Last year there was lots of fruit on the trees.

Mr. Brackett: I would like to ask Prof. Hansen which of his plums is the earliest plum.

Professor Hansen: The Opata is a cross of the Gold plum that Burbank got three thousand dollars for.

Mr. Brackett: What is the difference in ripening between the Opata and the Sapa?

Prof. Hansen: I have not got returns from the trial stations as yet. I should say perhaps a week or two weeks. I do not know that I can give you any help on that. The Opata is very much earlier than anything else I have got, and I think it is a very good thing. In a general way, Mr. Cook has come to the same conclusion I have about many of these varieties. In the sand cherry peach combination my seedlings have each but one pistil and his have five or six pistils. When it comes to the Japanese plum combination with the sand cherry we have some wonderful possibilities.

How to Market Apples.—The new method of marketing apples in the northwest is simply this: The growers organize and select their brainiest members for directors, and through the directors do business for themselves. It is necessary for these directors, who are growers themselves and live in the country, to employ a man to take charge of the details of shipping and accounting for the fruit, and for this purpose they employ a manager.

A manager should not undertake to assume the entire responsibilty for any of the heavy deals, but will have such questions determined by the directors themselves. This throws the responsibilty of the heavy deals on nine or ten men instead of one or two, and mistakes are less likely to occur. It also assures the business being done according to strictly honorable methods and precludes the possibility of anyone connected with the management reaping exclusive benefit of inside information.

Digitized by Google

My Strawberry Field.

PRESTON MC CULLEY, FRUIT GROWER, MAPLE PLAIN.

This is an interesting subject and one worthy of our best thought and action. This is a crop that can be grown by any one who is willing to take proper care of it, requiring less capital to start and reaping a harvest sooner than with any other fruit.

One of the first things to be considered is location. Many will tell you that any ground that will grow a good crop of corn is all right for strawberries. To many who do not have anything better this may be true, but you will all agree that you can grow a good crop of corn on land that will not grow a good crop of strawberries under like conditions. Now why is this true? Because corn is a much stronger feeder, and its roots penetrate to a much greater depth, thus securing more moisture.

From experience and observation, I prefer low, level land, rich in humus, well enough drained so that it can easily be kept clean, and not subject to overflow, with the ground water usually two or three feet from the surface. The strawberry will stand more water without damage than any other fruit in the northwest, except the cranberry. If you do not have any low land, conserve moisture from start to finish, and you will get berries.

The ground should be fall plowed *by all means,* so that it will be well settled and full of moisture in the spring. Start the harrow on this as soon as in good condition to work in the spring, and keep it up until planting time. I use a planker to pulverize any lumps and level the ground.

They should be planted on ground that has grown a cultivated crop previously, preferably potatoes, where no weeds have been allowed to go to seed.

If this is done it will save much time in hoeing and hand weeding later on. The plants should be put in the latter part of April or first of May, according to the season.

Mark the rows with a horse marker, five feet apart, spacing the plants from eighteen to twenty-four inches apart in the row, according to variety.

Cultivation should begin at once and continue throughout the summer, until the plants prevent, some time in September.

All bloom should be picked off the first year, so that the plants may put all of their vitality into making plants. As soon as they begin to throw out runners these should be turned lengthwise of the row and covered lightly with dirt. This is time well spent and is absolutely

Digitized by Google

necessary in dry years to get a stand. I usually go over the field with the hoe, about four times, and go through after there are too many vines to use the hoe and pull out any weeds. They should be kept clean all the time, so as to save moisture and fertility for the plants.

A very good tool to maintain a dust mulch, especially in dry seasons, is a home-made weeder, which is adjustable in width from two to five feet. Made in the form of a V, the side wings are five feet long, and are made of two by four hardwood. Old hayrake teeth are used five inches apart and nine inches long, and are put in slanting back about fifteen degrees. A centerpiece about four feet long is put in to fasten an old pair of cultivator handles to and the pieces for adjusting. This tool is so light that it must be weighted to make a good dust mulch. One great advantage is that it will take a whole row at a time and a good walking horse can cover an acre an hour.

Mulching with clean straw or marsh hay should be put on as soon as ground freezes hard enough to bear a team and wagon, and sometimes sooner, as in fall of 1910, when it froze and thawed a number of times before winter closed in. Now it is to prevent this freezing and thawing that we mulch, and to conserve moisture, keep berries clean and smother weeds between the rows. Do not mulch heavily enough to smother plants.

There is much difference of opinion as to the proper amount of straw to put on an acre. I put on about five loads per acre and leave it on as long as there is any frost in the ground. Then it must be raked in between the rows, or the plants will soon smother. If possible, do it after a rain, as the straw will pack much better and is not so liable to be blown out of position, but do not wait for one if it should come off, as a few days of hot weather will do much damage. Go over the field at this time and cut out any weeds or grass that may have come through the winter and repeat, if necessary, before fruiting time.

At this point allow me to give my experience of 1910. This was a freak season, one of maximum frost and minimum moisture. My field of two and two-fifths acres was exposed to eight killing frosts in blooming time, fully one-half of the bloom was killed, and yet I harvested 4,000 quarts per acre. This was on a mixture of peat and wash land. There was a heavy stand of plants, and to show how important mulch is, would say that yield was easily double on ground that was mulched over that which was not. There was one corner of field where the wind had blown it away.

Before picking time have as many pickers engaged as you are sure that you will need, and have plenty of picking stands and crates ready.

Digitized by Google

Keep berries well picked up and market at once. I dispose of mine through the Minnetonka Fruit Growers' Association, so that I have nothing to do with marketing, which is very satisfactory, as it gives me all of the time to devote to harvesting.

I will give you my method of renewing an old bed on low land—do not think it would do so well on high land.

Mow the field over the same day that you make your last picking, or as soon as possible. Loosen up the mulch and, as soon as dry, rake everything clean and follow with plow, cutting a furrow on each side of the row, leaving about two feet wide on each row. Follow immediately with a harrow, lengthwise, a couple of times, and then crosswise as many times as necessary to pulverize the lumps. This will leave from one-half inch to two inches of dirt on top of plants. Now, for the finishing touches, take an ordinary wooden hand rake, and rake off as much dirt as possible. This will leave from one-half to one inch of dust mulch around and over the plants, through which they will come nicely.

After you start at this work, do not let anything interfere, but follow one operation after another as expeditiously as possible, for any delay in getting surplus dirt off of plants may result in smothering. These plants, after having the dust mulch, start a new growth of roots above those of the year before and soon put up a luxuriant growth—but would say that there is a difference in varieties in responding to this treatment.

We have not yet attained unto the possibilities that may be reached in the production of this most luscious fruit, and yet many become discouraged and give it up, for it is one of the most uncertain crops. You may have a very good prospect in the spring, and yet at fruiting time not get enough to pay expenses. While there may be various reasons given for failure, the main reason is usually lack of moisture.

Mr. Miller: Do you throw this dirt over the row or away from it?

Mr. McCulley: Both.

Mr. Miller: One furrow each way?

Mr. McCulley: Yes.

Mr. Miller: With the amount of soil left on the plant, if you throw it away you would not have much left.

Mr. McCulley: I have continued this on low land, I have cropped six crops with one planting.

Mr. Bracken: You would not recommend it on upper ground?

Mr. McCulley: No, sir.

Mr. Bracken: What is the reason?

Mr. McCulley: Lack of moisture.

Digitized by Google

Mr. Brackett: If you had a marsh with peat, would you recommend that for strawberries?

Mr. McCulley: I have been going slow on peat, but last year I had the best strawberries on pure peat.

Mr. A. W. Richardson: How would it work to put peat on upland?

Mr. McCulley: It would be all right, but expensive.

Mr. Richardson: Would it be any more expensive than manure?

Mr. McCulley: Not if it was handy. It would add nitrogen and put it in the necessary organic condition.

Mr. Kellogg (Wis.): He plants his strawberries five feet apart, that is the reason he leaves two feet. I would fill up the furrow, and throw it from the plant, and throw it crosswise, and I would not use any rake. We find no trouble with plants.

Mr. N. H. Emmans: In the city where you have city water, would you spray the plants with it or would you run the water through?

Mr. McCulley: That is a subject that properly comes under irrigation, but I believe where city water is used I would recommend irrigation by sprinkling.

Mr. Kellogg: I would not.

Mr. McCulley: I have noticed this, that when we had a light picking and we got a good rain immediately after, our next picking was much larger, and I believe if you could wet down the leaves thoroughly and evenly it would be of considerable benefit.

Mr. Emmans: Then if you had an abundance of water you would spray?

Mr. McCulley: Yes, I would.

Mr. Kellogg: If I had an abundance of water, I would run it in ditches.

Mr. A. W. Richardson: I would not advise applying the water directly to the plants, but let it run between the rows. Where water is applied directly to the plants by spraying and the sun shines on the leaves, they become sickly, and in a few days the plants are dead.

Mr. Brackett: If you can turn the hose directly on in a greenhouse without injuring, I cannot see why it would hurt strawberry plants to apply water in the same way.

Mr. Clausen: I am in the greenhouse business and grow roses to a considerable extent, and I want to say that roses are different from anything else. If you do not spray them you cannot keep the red spider off. I think as to the matter of spraying strawberries we have got to be very careful, because we are liable to injure them. When they commence to bud and bloom, that is the time the strawberries need water if they need it any time. I have a friend sitting beside me who can tell you more about that matter than I can. He has a way of watering his strawberries that I think is a better way than any I have ever seen, and that man is Mr. Gardner.

Mr. Gardner (Iowa): I have a little irrigating plant with enough water so that I can water a small patch, but I use the form of irrigation for my strawberries that they use in California. In an ordinary

Digitized by Google

season you can set out strawberries and grow them without paying particular attention to irrigation, but when we have a dry time, when the season of the year is dry in which strawberries ought to make roots, as it was last summer and the fore part of this summer, then you must give them water. We set out little seedlings right in the hottest and driest time of the year, but I do not believe we lost a single plant. We prepared the ground properly, and then we made a little shallow trench right across the ground. You have got to have the ground pretty level so the water will not run away too fast. If you let the water run down a row, let it run slowly; that will soak down a foot or eighteen inches deep. The next morning set out your plants, and you will find you will have enough water there to last the next six weeks. The water will soak into the ground, and it will be all right for planting. But if you

Picking everbearing strawberries on Chas. F. Gardner's home place, in Osage, Ia.

set out your plants and leave your patch and come back five or six weeks later you will find everything dead.

It is just as necessary to cultivate and bring about a condition of dust mulch after you have irrigated as it is at any time, and even a good deal more so, because where the ground is wet and the sun is shining upon it, as it does all day, you will find the ground will bake so hard that it will form a hard crust, and nothing will thrive under those conditions.

While I am on my feet I want to say a word about setting out strawberry plants. If you have got money enough to pay from three to six dollars a hundred for strawberry plants, I hope you will know enough to know how to take care of those plants after you get them. There is really no sense in losing plants if you buy them from a responsible nursery. They are all carefully packed, and when they are shipped they are covered with moss, and they come to you in just as good condition as when they came out of the ground. I have paid as high as five to ten dollars a dozen for some plants that I have bought, and I commenced work in the way of preparing my ground before the plants came. I got my ground in shape just as I wanted it, and that was in perfect shape for planting. I think I know how to put ground in good

Digitized by Google

shape to plant strawberries, and when the plants come I drive a row of stakes about eight feet apart and let them stick out about a foot above the ground, and then I take a string and commence at one end and make a line from one stake to another clear through. Then I set out my plants, and after that is done I take a piece of burlap from the packing shed and run it over lengthwise of the row, and that goes over the whole length. Then I sprinkle the burlap with water, right in the hot time of the day, and the evaporation that takes there will make it nice and cool, and a plant will never show the least sign of damage or take any harm whatever in being moved.

I have a little record here of twelve plants I bought last spring. I got twelve plants of two firms. I picked the bloom off after I set the twelve plants all but three blossoms. In the first place, these plants came from New York, almost two thousand miles from my place. I set out these plants and picked the blooms all except three, and I raised three as big berries as I ever saw in my life. These three blossoms I left on grew the three berries, and I took the seed out of those berries and planted it, and I have one hundred and twenty as fine plants as I ever saw that I grew from that seed. That all came from keeping the blossoms back from those original twelve plants except as I have stated, and I have as a consequence got a nice lot of new plants. (Applause.)

Col Burnap (Iowa): I agree with the writer of the paper in regard to the first year's cultivation of the strawberry field, but regarding the second year there is a great big interrogation point in my mind. Once I cultivated ten acres of strawberries the second year as this gentleman suggested, except one piece along one side where there is a little slough difficult to get across. The next year in picking, whenever one of the boys got a big picking, I laid it to the other fellow, but when I inquired they said they got it over on the short rows. I concluded I would find out what the short rows meant. I found it was those rows I had omitted and had not touched. I am expert accountant by profession, and after I got through picking I sat down and made a calculation, and I figured that if some good friend had come along and paid me for what I didn't know I would have been a thousand dollars in pocket. (Laughter.)

MUCH of the trouble with a gasoline power sprayer could be prevented if care were exercised in the fall to clean the outfit thoroughly, to drain the engine, to care for the nozzles, leads of hose, etc. Then, in the spring, another careful overhauling ought to put it in such shape that there should be little trouble during the spraying season.

Not only should all this be done, but always after a lime and sulphur or other caustic spray is used the machine should be thoroughly cleaned by running clear water through it, including hose, rod and nozzles. The spray will not only injure different parts of the machine, but will also harden and small pieces will clog nozzles when again used.

Digitized by Google

Evergreen and Deciduous Windbreaks for the Western Prairies.

JOHN W. MAHER, NURSERYMAN, DEVILS LAKE, N. D.

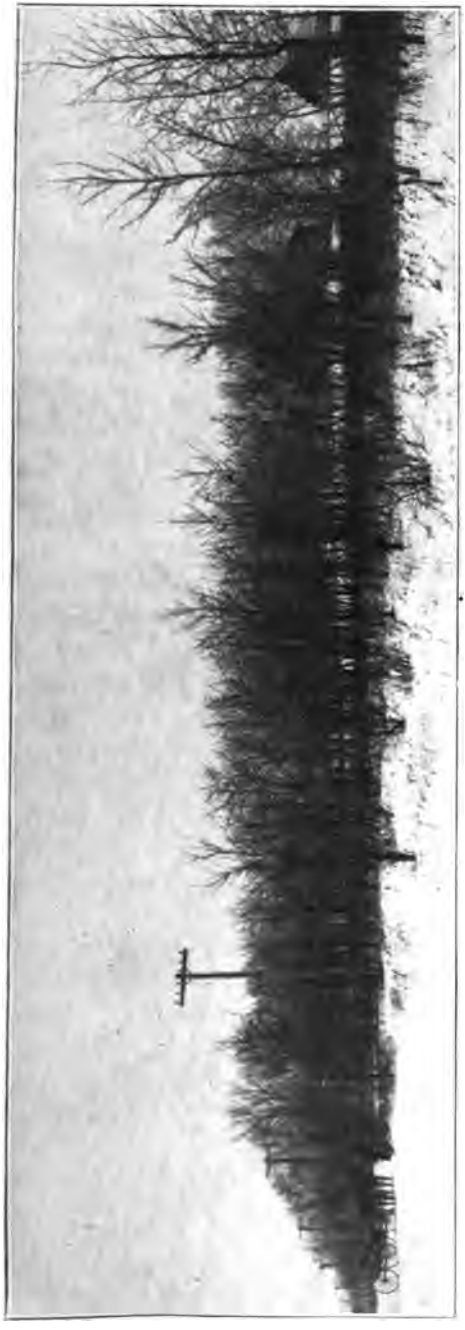
Windbreaks are necessary to enable us to raise more and better live stock, to grow more fruit, to conserve the fertility of the soil and to do better farming. In a word they are necessary to make farming more profitable and farm life more enjoyable.

The thoughtful home builder will provide a shelter against the wintry storms by a judicious and careful planting of evergreens. Two rows of evergreens planted so as to break joints will give more protection against the cold wintry winds than ten rows of deciduous trees, while four rows of these trees will make an impenetrable wall through which no wind can blow. In the dead of winter when all deciduous trees are bare and leafless, the evergreen stands forth in its magnificence—an ornament as well as a shelter. It is thriving and arrayed in all its beauty when all other trees are barren and dormant. It is equally valuable in protecting us against our summer siroccos. A few rows of evergreens are as good as numerous rows of deciduous trees because of the density of their foliage from the surface of the ground upward.

VARIETIES TO PLANT.—The varieties to plant in consideration of their hardiness and value are as follows: First, is our native western yellow, or bull, pine, the Ponderosa. This tree defies drought and cold, and the hot winds and burning sun, and grows singly equally as well as in solid or mixed plantings. The jack pine, the Colorado blue, the Douglass, the Black Hills, the Englemani, the white and the Norway spruces, and the Austrian and Scotch pines are likewise very satisfactory in shelter belt plantations.

In my shelter belt of deciduous trees for the field I would always have the outer row on the south or west. For this row I would plant caragana, buffalo berry, Russian olive, wild cherry, Juneberry, wild plum, thorn apple or willow. These limb from the ground up, are absolutely hardy and will protect the balance of the shelter belt from the drying winds and sun. The next row would be of Carolina or Norway poplar or white willow to supplement the shelter for the remainder of the belt by carrying it high above them and assisting them to come up quickly. Next I would have four to six rows of native green ash, white elm, silver maple, black walnut, European larch, hackberry or wild black cherry, alternating or following each other until at least eighteen rows are planted, making with the two rows at

Digitized by Google

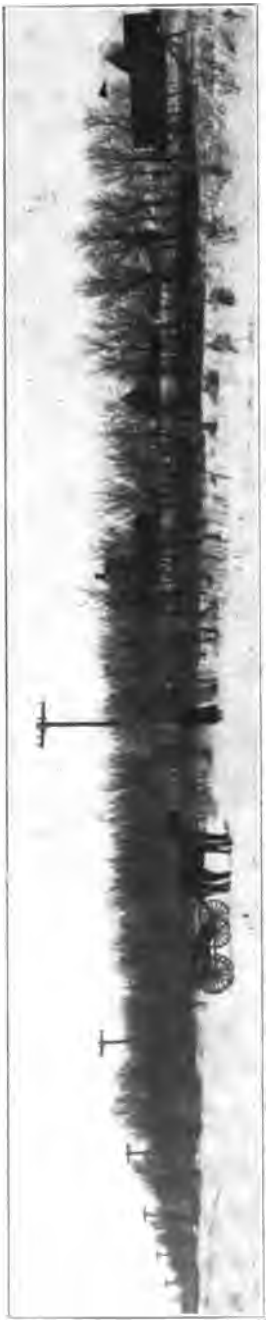


Windbreak at J. W. Maher's. Originally ash and box elder, the ash has now largely taken the place of the slower growing tree.

the outside twenty rows in the shelter belt. Less than twenty rows of deciduous trees will not make a complete shelter belt that will protect itself from sun and wind and snow and at the same time quickly establish forest conditions, hold snow enough to carry it through dry seasons and rapidly tower up into high growing trees, having a far reaching effect as a protection to the field.

If the shelter belt is designed to protect the home buildings and stock, plant the same number of rows and the same varieties in the same manner, with the exception that the north and west should be the outside and that this row should be trained as a hedge or limbed to the ground. The native fruits above mentioned which are valuable in the home and as food for the birds might advantageously be transferred to the inside of the planting, at least as to the north wing of the belt. It would be well also to plant for a snow catcher two rows of willows, six or eight rods to the north and west of and parallel with the main planting. The intervening space could be used for orchard, garden or meadow.

Digitized by Google



Another view of Mr. Mayer's windbreak.

How to Plant.—Close planting causes trees to shoot straight up and make tall trees instead of letting them limb out and remain low. For example, the elm is inclined to waste itself in limbs unless planted closely, but when so planted it stalks up as well as other trees.

In planting, plow deep furrows, going two or more times in the same furrow if necessary. Hold the tree erect in the furrow and draw the earth from each side with the feet and tramp it solid about the tree until the roots are well covered. The balance of the earth to fill the furrow can be better worked in gradually when cultivating the trees. When using small trees, each man should plant 2,500 trees in ten hours by this system and do better planting than if done by a spade. Plant in rows four feet apart with the trees two feet apart in the row. This gives each little tree eight square feet in which to grow. This is ample room until the tree attains a height of twelve to fifteen feet, when Nature herself will begin to thin the planting or the owner can cut out the weaker trees for poles or firewood, or to transplant or sell.

A man who digs the holes with a spade and plants 75 to 100 trees feels that he has done a day's work. He had much better dig the holes with a team and plow and plant 2,500 to 3,000 trees a day into a furrow, he will find it much easier and a better done day's work. Young trees can be bought by the thousand for little outlay, and two men can easily plant 5,000 in a day. Any farmer can profitably spend a few

Digitized by Google

days each spring planting trees. The time required to cultivate them during the season is of no consequence, as they can be cultivated each time the potatoes or garden is gone over. Two season's cultivation will be sufficient when the trees are closely planted, and after that the trees will shade the ground and care for themselves. Before one realizes it, he has a grove that will take care of itself and ever after be a source of pleasure, satisfaction and profit.

If the outlay for small trees is too much, prepare your ground as for a garden and get poplar and willow cuttings from your neighbor or from a nurseryman, mark your ground with a corn marker, insert the cuttings one foot apart in the marks, setting them as solid as possible and leaving one bud exposed, and cultivate them thoroughly for three or four years. These poplars and willows will make very effective windbreaks in a short time, as they are the most rapid growing trees we have during their first years of growth. There is no excuse for sitting around complaining about the treeless appearance of our farms. Trees are not expensive. If five or ten dollars per 1,000 for little trees is too much, then get the cuttings at two to three dollars per 1,000 or cut them yourself in your neighbor's shelter belt.

Railway corporations find that shelter belts are cheaper and more effective than snow fences, and at the same time they are valuable for the timber produced and as an attractive improvement to their property.

I am trying to point out the best way to plant trees, the easiest way and the cheapest way, and I plead for their planting. There are no improvements you can make on the farm that will yield such valuable and rapid returns upon the investment. This is because the shelter belt will constantly add to the value of the farm and because the cost of the trees and their planting is so small.

We pioneers have neglected to plant shelter belts and still remain idle, discussing the subject, while the winds, year after year, mow down our young crops, shell the ripened ones and blight the growing ones. The snow piles around our houses and barns and buries the hay-stacks, and the north wind doesn't feel as though it were "tempered to the shorn lamb." However, the shelter belt will temper the north wind to your profit and to the comfort and pleasure of your household and barnyard occupants.

Effect on Soil Movement.—Furthermore, the winds and waters are carrying away the soil from our fields and robbing them of their humus and depositing this soil so carried away, with its humus and richness, in the low places that are covered with grass, and in the groves and shelter belts. Wherever the ground is covered, this covering retains the drifting soil and fertile humus and the bare ground is robbed by the

Digitized by Google

winds and waters, to the benefit of the ground that is covered. Moreover, the grasshoppers and the bugs and the grubs and worms are becoming altogether too numerous. We need to encourage our friends the birds by furnishing them food and shelter and nesting places, so that they can raise more birds to work for us and protect us from the plague of locusts and devouring insects.

The shelter belt has not only its aesthetic side, which is not to be despised, but also its practical side, and I believe we have done without its protection much longer than we should have, to our great damage and discomfort, and that out of sheer necessity we must plant it.

Shelter belts prevent the moving and carrying away of humus and the other most fertile constituents of the soil. They capture and hold the humus and fertile soil which is carried away from the neighboring lands. These losses and accretions are not inconsiderable. We have the upland and the bench and the bottom, the sandy piece and the clayey piece, all due mostly to the action of wind and water in transferring the soil or its constituent parts. They take from one place and give to another.

The high winds and the torrential rains on the plains cause a much greater soil movement than that which takes place in our humid sections where the velocity of the wind is not so great, the rain storms less furious, and the earth's surface more moist and better covered by vegetation. There are also great losses throughout the eastern states where the forest clearings are large, and we find that the thoughtful agriculturalist is protecting his holdings by shelter belt plantings of trees and by terracing his land, leaving strips of grass to hold the soil.

On the Azore Islands the lands are divided into narrow strips and protected against the winds by high stone walls supplemented by rows of tall trees. Crop raising was found to be too hazardous without this protection.

The lands for many miles around Mount Vesuvius are fertilized by the imperceptible deposits of dust and ashes carried to them by the atmosphere and winds.

Another remarkable illustration of the transference of soil by the elements is found in the ancient city of Rome, which was originally situated on seven hills. These hills are not so noticeable at the present time, and the excavations in the Forum, which is situated in a valley, show that the ancient street level was more than thirty feet below the present street level. Such has been the result of the unsettled and changing surface of the soil. Similar cases are found in all the old countries.

Digitized by Google

CONSERVATION OF THE SOIL.—On the plains the soil movement by the action of wind and water is so great that the saving and conserving of the soil itself amply pays for the shelter belt. It pays to keep the fertile elements of your own soil; and if your neighbor "throws his to the wind" it pays to capture and add them to the "leeward" of your shelter belt.

We are trustees only, for the time being, of the small portion of Mother Earth to which we each hold title, and we are by right and conscience bound to transmit it unimpaired to the next holder. The conservation of the fertility and productiveness of our portion is a subject to which we should all give careful thought and study, and it is a subject also for the thoughtful attention and study of our statesmen and lawmakers.

One of the greatest oversights of the early settlers on the prairies was their failure to plant shelter belts and groves. The few that were planted have proven to be the best investment made by those who planted them, and this, too, whether they retained or sold the land. A land purchaser will gladly pay well for the grove or shelter belt, and in almost every instance will take the land so improved at its additional value much more readily than he will the land barren of trees at any price.

Incidents and Anecdotes in Developing Irrigation with Lake Muck.

C. R. SANDVIG, BELGRADE.

So far as I know I am the originator of dredging muck to irrigate with, instead of just using water. The jobbers who sold me the pump and the manufacturers who made it both expressed surprise when they were informed that I had used one of their small pumps for dredging, and they promptly asked for information as to how I had succeeded in dredging successfully with such a small pump. As a small pump may be a rather indefinite term, it may be of interest to know what the manufacturers mean by a small pump in this instance.

A speaker made the statement at the last annual meeting that he knew somebody who had spent thousands of dollars on irrigation devices and made a failure of it. They must have invested in a big pump. My pump cost something less than $65. The power, a second-hand, twelve-horse steam threshing machine engine, which so far has worked as good as new, cost $100. The pipes are old 4-inch boiler flues, which are just as serviceable and far more convenient than stand-

Digitized by Google

ard pipes and cost $1 per 18-foot lengths. The couplings are short scraps of standard pipes bought from scrap iron dealers for one cent per pound. The joints are made by slipping the boiler flues inside of the standard pipes like a stovepipe joint. The capacity of this outfit is 260 gallons per minute, or a little over one ton of water for every sixty seconds, or, as an ordinary old-fashioned kerosene barrel holds fifty-two gallons, it would amount to just five such barrels filled to the brim with muck and water dumped on the orchard or garden sixty times an hour.

One of the pumps made by this firm, though not the largest, has a capacity of 35,000 gallons per minute, which, in other figures, would be 8,886 tons of water an hour, or 673 barrels a minute. Such a pump

A centrifugal pump.

with complete equipment would cost several thousand dollars. But I would not recommend a pump with a capacity of nearly two and a half tons of water a second for irrigating the ordinary farm or commercial orchard in Minnesota, even in a year like 1910. Of course, these are not the common plunger or piston pumps that have now been used for a generation or more to replace the old oaken bucket, but the centrifugal pump, which has neither plunger nor valves and works like a cyclone. It is a pump used for special purposes and not very well known to the average man. I had accidentally come across one of these pumps at an exposition, and a view of its construction gave me the idea that with such a pump it should be possible to pump muck to irrigate with just about as easily as to pump clear water.

There are a number of centrifugal pumps made which I did not then know, but the exhibitor intimated that there were others in telling of the superiority of his own. However that did not matter at the time, for he convinced me right on the spot that though there might be others there were none other worth having. Later, after thinking it over some, and after coming away from the magnetic influence of the exhibitor of this particular pump, I became suspicious. For you can't

Digitized by Google

sometimes most always tell when listening to a dealer talk about his goods whether to believe the very words he says or whether it may not sometimes be better logic to believe the very opposite. So I began to reason that possibly all other centrifugal pumps might be still better than his.

But where to find these pumps was another problem. The ordinary implement dealers knew no more about centrifugal pumps than they knew about the internal anatomy of mud turtles, which these pumps outwardly very much resemble. Even the catalogue houses with their twelve hundred pages of all kinds of merchandise did not list a single centrifugal pump. Memory is a peculiar machine, and in this emergency I happened to remember that I had at some time read an article somewhere that was credited to "Irrigation Age," Chicago. "Irrigation Age" was a strange name to me, and I did not know whether it was the peculiar name of a man, the title of a book or the name of a magazine devoted, as the name would indicate, to irrigation, but concluded that it was the latter, and, if a magazine devoted to irrigation, reasoned that very likely it would carry advertisements of centrifugal pumps. So I wrote a letter and addressed it to this mysterious name, "Irrigation Age," Chicago, asking for a sample copy and inclosing a quarter with the request that they send me a list of firms who might have advertised centrifugal pumps in their magazine in times passed, but whose advertsements might not happen to appear in the current issue.

My guess proved correct. "Irrigation Age" was a magazine. A sample copy arrived, but no letter, and I really felt slighted. A couple of advertisement of centrifugal pumps appeared in the magazine, but having determined to investigate and find the very best centrifugal pump made I was not satisfied. A couple of days later, however, a couple of letters arrived from manufacturers of centrifugal pumps, telling me that "Irrigation Age," Chicago, had notified them that I was in the field for a centrifugal pump and that catalogues were being mailed under separate covers. The next day three or four catalogues of centrifugal pumps were received, and more letters from dealers telling me that "Irrigation Age," Chicago, had written them that I wanted a centrifugal pump and that catalogues were being mailed under separate covers. The next day there were some more, and for a week or more nearly every mail brought some catalogues of centrifugal pumps and letters from jobbers and manufacturers telling me that "Irrigation Age" had notified them that I was in the field for a centrifugal pump and that catalogues were being mailed under separate covers.

Digitized by Google

My curiosity was fully satisfied, and I doubt if there was a centrifugal pump made or sold in the United States of which I did not receive a catalogue at that time. My suspicion proved correct, all these makes were really better than the pump I had first seen at the exposition. This list of catalogues gave me a splendid opportunity to pick out a pump for pumping muck. Some of the catalogues also contained some very valuable and some rather startling information. One item is of special importance. The pump I selected was provided for connecting to a 3-inch discharge pipe. Without knowing more, I would certainly not have invested in more than 3-inch pipes. The friction of the 260 gallons per minute through 100 feet of 3-inch pipe laying on the level would require as much power as to lift the water seventeen feet straight up, and as there were 700 feet of pipe the total friction alone would have been equal to raising the water 119 feet in addition to the actual lift of about 20 feet—had I not provided larger pipes.

In adopting a new science it may be well for us to bear in mind that there may be much about it for us to learn. In the papers read on irrigation at the last annual meeting I saw where one man failed to get results and even damaged his pump because he had not made proper provision for friction and in using a piston pump had not provided an air cushion, when a neighbor came along and told him what was wrong. Had not that neighbor come along at the right time with the right information one of our leading horticulturists might have joined the list of those who declare that irrigation is not practical. And had it not been for selecting a pump from the great number of catalogues with which Irrigation Age, Chicago, caused me to be flooded instead of buying the first centrifugal pump that I had seen, and for some of the hydraulic information contained in those catalogues, I should no doubt never have succeeded in developing irrigation with muck.

After selecting my pump I found some trouble with the other dealers who had sent me catalogues, for they all wanted to sell me a pump. My embarrassment was very similar to that of a friend of mine at Lake postoffice, Idaho. Peter had reached the age and position where he naturally did not like to "batch" it alone, but out there in the west there were not girls enough to go around, except a couple old maids that nobody seemed to want, and Peter after going to see them a couple times decided that he did not want them either. So he sent an advertisement to an eastern paper: "Wanted—lady correspondents." A number of girls replied, and Peter enjoyed all their letters very much and replied to them all the first time. But after a while he neglected all the rest of the girls to correspond with just one. However, the rest of the girls did not neglect to correspond with him, and one of them

Digitized by Google

when writing for the third or fourth time burst into poetry and wrote at the head of her letter:

"Oh, had I the wings of an eagle,
How soon would I fly to Idaho."

And Peter had to just sit down and write her that he did not want her because he had picked out one that he liked better. And that is just what I had to write some of those manufacturers in regard to their pumps.

When I sent the drawings and description of my simple device for taking in muck continuously and keeping out stones to the jobbers they wrote back: "Your sketch is perfectly clear to us, and we must say that you have displayed great ingenuity in the installation of your pump." Which is perhaps true of my present device, but in looking back at some of the arrangements that I at first tried or experimented with I am now surprised at the ignorance I displayed, and if I finally succeeded in inventing a device that deserves commendation it is not due to any display of genius, but rather to the fact that after much experimenting there was finally nothing left to devise but something that would be simple, practical and efficient.

A description of this arrangement will no doubt seem as dry as a soda cracker sandwich with a smoked herring in it, but I assure you that there is nothing dry about it when in operation. It consists of a water-tight box with a lid on it, placed on the lake bottom, anywhere in the lake where it is far enough out to be clear from the beach sand and where the muck is deep enough, and connected with the pump on the beach with submerged pipes resting on the lake bottom. A short stub of pipe projects out of the top of the box and to this is attached an elbow, and to the elbow is attached a wooden pipe in short sections, and at the end of the wooden pipe is another elbow and to that is attached the intake pipe. The point of the intake pipe can therefore be lowered or raised, adjusting it to any depth of muck by swinging it on its elbow. The wooden pipe can at the same time be swung forward in a circle around the box as the muck is being cleaned up. When one circle has been completed another short section of the wooden pipe is inserted, when it is ready to swing around again, increasing the diameter of the hole. A raft is fastened to the pipes above the intake, the pipes holding the raft in position and the raft supporting the pipes at a proper depth. The wooden pipe is kept level and submerged a few inches. As movable joints are apt to leak a little the whole suction arrangement is submerged, either resting on the lake bottom or suspended near the surface. While a centrifugal pump is not particular as to what it drinks it is very sensitive to air. It will pump bullheads all right if

Digitized by Google

they hold their breath until they pass the pump, but it is best to not experiment with devices that are likely to give the pump air.

A man works on the raft helping the soft muck to get started with a mortar mixer's hoe and keeping the intake pipe adjusted to the right depth and swinging it forward. There is no screen to clog with weeds. Stones that might do damage to the pump are caught by gravity in the catch box, from which they can be removed by removing the lid. After running the pump for several days last summer I did not find a single stone in the gravity catch box that could not have passed through the pump. Had the intake found any such stones, however, the gravity box would have caught them. It did catch some sand, and for the first time we found no sand in the ditch at the end of the discharge pipes.

Chunks of weeds or roots would quite often clog at the end of the 4-inch intake pipe, so that we had to raise it to near the surface and poke a stick into it to loosen them up. But once passed the first elbow they never clogged. The centrifugal pump would eat up weeds about as nicely as it would drink clear water. We have pumped besides roots and muck, crabs without killing them and full grown bullheads without breaking their skin and clam shells without cracking the shell.

The effects of irrigation during a dry spell is like a much needed rain. The muck adds humus or fertility to the soil faster, I think, than it could be applied by two men with two manure spreaders and eight horses, besides applying it where a manure spreader could not be taken without doing damage, and we can pump muck without stint when there is no manure to haul.

Annual Meeting, 1912, Wisconsin State Horticultural Society.

PROF. F. L. WASHBURN, DELEGATE, ST. PAUL.

Your delegate met with the Wisconsin Horticultural Society, whose convention was held January 9th, 10th and 11th, in Madison. With a reported membership of about 1,900, and an appropriation of nearly or quite $10,000 annually, this society, with its pushing secretary, Mr. Cranefield, is doing much to forward the cause of horticulture in Wisconsin. Their slogan appears to be "Keep Wisconsin on the map," and they are doing all they can to encourage the planting of fruit trees in every possible place in Wisconsin available for this purpose.

There was an average attendance of about one hundred at each session, the evening sessions being somewhat more largely attended.

Digitized by Google

The sessions were held in the beautiful assembly room of the new capital, where the magnificent environment was of itself a stimulus. The meetings opened at 2 o'clock on Tuesday, January 9th, with an address by Secretary of State Frear, and papers on the marketing of the apple crop, co-operation in marketing of fruits, etc. The delegates were also introduced at this time, and each one spoke from five to ten minutes. There were representatives there, as delegates, from Illinois at large, from northern Illinois, from Iowa at large, and northeastern Iowa, as well as from Minnesota.

In the lobby adjoining this beautiful hall there was arranged an exhibit of apples, which, while not as large as would naturally be expected, or as the exhibit of the Minnesota society, was indeed very creditable. Your delegate counted about 500 plates and trays, and among the varieties exhibited there were the following:

Golden Russet, Fameuse, McIntosh, Pewaukee, Utter, Seek-No-Further (or Westfield), Jonathan (grown in favorable places), Walbridge, Northwestern Greening, Wolf River, Scott's Winter, Ben Davis, Red Winter, McMahon, Haas, Newell, Windsor Chief, Baldwin (raised in suitable localities), Winter Banana, Gem City, Tolman, Longfield, Boska, Champion, Romanstem, American Blush, Hibernal, Delaware, Babbett, Senator, Hyde's King and various seedlings.

The Secretary of State's address was an appeal to the citizens of Wisconsin to be keenly alive to the immense resources of Wisconsin, and advantages of Wisconsin over states far to the west which were more extensively advertised.

Commission men got a pretty hard knock in the paper of Mr. Bassett, of Baraboo, who urged the necessity of raisers dealing directly with retailers.

A resolution was passed by the society to ask the state legislature for a building for the exclusive use of the Horticultural Society at the State Fair, and also a resolution to ask of the governor of Wisconsin that there be a representative of the State Horticultural Society on the State Board of Agriculture.

Wednesday evening was given to the ladies, where papers upon "What Women Can Do to Keep Boys on the Farm," "Wild Flowers of Wisconsin," "Country Life," "Children's Garden," etc., were discussed. All of Thursday forenoon was given to papers and discussions on nursery topics, and in the afternoon there was a unique contest among students in the Horticultural Department of the University, for three prizes for $5, $3 and $2 respectively, for the three best five-minute talks. On the whole, the meeting was undoubtedly a success, which success was, in large measure, due to the efforts of a wide-awake secretary, who is certainly a "live wire" in matters horticultural.

They have a strict horticultural inspection law in Wisconsin, framed by the inspector, Mr. Sanders, which meets with the approval of almost every nurseryman I talked with at this meeting.

Digitized by Google

The Utility and Beauty of Roadside Trees.

CHAS. M. LORING, MINNEAPOLIS.

During a visit last summer in western New York, I was greatly impressed by the miles and miles of fine roads which were lined with grand old trees that were planted sixty years ago. These trees form arches over the roads, and their refreshing shade and great beauty attract visitors from all of the large cities. In an automobile ride of over one hundred miles, which I enjoyed in one day, there were but few short sections that were not lined with elm and maple trees, which gave a fine setting to the neat farm buildings, and it seemed to me that the occupants of these houses must enjoy more of life than did those who lived in houses that were not surrounded with these most beautiful of all God's gifts to man.

I could not help contrasting these pleasant and well cared for roads with those of our own state, that are today as bare of embellishment as when they were first opened to the public as thoroughfares.

There are a few farmers in Minnesota who have planted trees on the roadside, but the majority have destroyed those which nature had planted. I have seen rows of beautiful elms that grew on the roads of Hennepin county destroyed by farmers, who said they shaded their fields, an act of vandalism that should have landed the culprits in prison.

The worst vandals who destroy trees are the telephone and telegraph companies. All over the state where there are any trees one can see the result of their barbarous work in the trees they have mutilated by chopping off limbs and tops and in many instances cutting them down. There was an instance of this of recent occurrence in Hennepin county where twelve large elms were sawed off a few feet from the ground. So long as these acts go unpunished, just so long will our highways be unattractive.

A large number of the states have very stringent laws for the protection of roadside trees and for encouraging the planting of them. Pennsylvania and New York pay premiums for tree planting.

The following act went into effect in the state of New York on the first day of last September, and on that day the automobile clubs made a raid on the offending signs and destroyed many hundreds of them.

"A person who wilfully or maliciously displaces, removes, injures or destroys a mile-board, mile-stone, danger sign or signal, or guide sign or post, or any inscription thereon, lawfully within a public highway; or who, in any manner paints, puts or affixes any business or commercial advertisement on or to any stone, tree, fence, stump, pole,

Digitized by Google

building or other structure, which is the property of another, without first obtaining the written consent of such owner thereof, or who in any manner paints, puts or affixes such advertisement on or to any stone, tree, fence, stump, pole, mile-board, mile-stone, danger-sign, danger-signal, guide-sign, guide-post, billboard, or other structure within the limits of a public highway is guilty of a *misdemeanor. Any advertisement in or upon a public highway in violation of the provisions*

A magnificent wayside American elm.

of this subdivision may be taken down, removed or destroyed by anyone."

A misdemeanor is punishable by a fine up to $500 or one year in jail, or both, at the discretion of the court.

Such an act as this should be passed by the legislature of Minnesota at its next session. There should also be passed an act for the encouragement of planting and protection of trees on the highways.

The natural scenery of our state is very beautiful, and we can add to its beauty and to the comfort of its citizens by lining its highways with trees.

Digitized by Google

The state of Pennsylvania pays a bounty of one dollar for every tree that is planted on the public roads. The trees must be placed seventy feet apart and cared for three years.

There are in many sections of Minnesota young elm and maple trees that grow in groups within the limits of the four-rods-wide roads that can be uniformily planted at a very small cost. Let us take up this important work and add another to the obligations the citizens of Minnesota owe to its State Horticultural Society.

"What does he gain who plants a tree?
A dower of thanks from the men to be,
A deed to live in the days to come,
When his brain is dust and his lips are dumb."

A Topworking Discussion.

Mr. Emil Sahler: How long does it take a grafted tree to bear?

Mr. Reel: The trees come into bearing in two and three years; some claim it will take only a year, but I have not had that experience.

Mr. Kellogg (Wis.): Would you not graft earlier than four years?

Mr. Reel: I would, I think.

Mr. A. W. Richardson: When is the best time to top-work?

Mr. Reel: The best time is to get at it as early as you can without fear of too many cold nights. About seeding time is as good a time to begin as any. It is a little harder to do good work when the leaves are on because there seems to be so much sap that the bark under the cleft raises away from the wood. I do not like that.

Mr. A. W. Richardson: Why do you prefer the Virginia crab and the Duchess instead of the Hibernal?

Mr. Reel: I happen to have the Virginia crab, and I also tried grafting on the Duchess. I believe it was Mr. Kenney that had the Malinda on the Duchess. I thought I would try to graft it with the Jonathan. I have found nothing better to graft on than Virginia. I have found Virginia brings larger fruit, and it brings better fruit than Duchess.

Col. W. A. Burnap (Iowa): Have you had it blight?

Mr. Reel: I have not had body blight.

Mr. Sahler: Which is the easiest way to graft, on a stem the size of a slate pencil or one-half an inch thick?

Mr. Reel: The nicest graft is usually from a third to half an inch thick, or one to two inches thick in a cleft graft. I always cleft graft. A cleft graft does not look so nice, but it works better, I think. It heals over faster after you put your scions in. I always put in two, as one may not grow, and if both happen to grow I can cut one away.

Mr. Pond: I have had better success by bark grafting than cleft grafting.

Mr. Reel: That is pretty nearly like budding.

Mr. Pond: You have a larger surface to start on.

Digitized by Google

THE VEGETABLE GARDEN

Seasonable Notes for April

By H. J. BALDWIN, NORTHFIELD

This is the season for sowing the hardy vegetables and caring for the tender plants. Every family should have a hotbed or at least a cold frame unless they are sure of a good place to buy plants at a reasonable price. Tomatoes should be transplanted twice before the final transplanting. As soon as the plants are up and commence to get spindling, transplant into rows in the bed about three or four inches apart and set in deep enough to cover the stems up to the leaves, the plants to stand about one-fourth of an inch apart. Here they can grow for two or three weeks, after which time they should be transplanted again, this time setting them singly about four inches apart each way, at an angle of 45 degrees, covering the stems again to the leaves, thus getting an extra root growth. From now to the time of setting in the field, give plenty of air and water; they should remain here until about May 20th before setting in the open field.

Cauliflower should be handled like cabbage but will not stand as much cold as cabbage.

Celery plants sown in March in flats should be transplanted as soon as they commence to get at all spindling, as in the first transplanting of tomatoes—only set into cold frames if the weather will allow; here they can grow until ready to set in the field. Other sowings of celery should be made during the month for late fall winter use.

The preparation of the soil is very important—proper fertilizers and putting the soil into good, mellow condition. As soon as the soil can be worked at all spinach can be sown, onions or onion sets next; soon parsnips, oysters, outdoor lettuce, radish, carrots and beets. By sowing beets three feet apart a row of spinach or radish can be sown between, which will mature and be used before the beets need the room. The same process can be followed with parsnips and carrots.

I have followed this method of sowing and covering small seeds: Run the Planet Junior seeder rather light in covering; then follow with a small wheel plow making a light ridge over the seed. After heavy rains a steel rake can be used to cut the crust over the seed at the same time destroying the weeds that might be coming up.

Many people sow too much seed, thereby making it necessary to thin out; or if not thinned, vegetables are small and inferior. A study of varieties of the same vegetable will show that some kinds can be sown twice as thick as others, as they may vary so much in top growth.

As soon as possible the early potatoes should be placed in shallow crates, seed end up, in a light place where short sprouts may start; this will hasten the crop some time. Do not cut until ready to plant.

It sometimes pays well to plant a little sweet corn the last of April. If seed should rot, there will be plenty of time to replant.

Much may be done by way of preparation of soil for May planting, manure hauling for corn, squash and the vine crops.

If the spring should come off dry, the moisture can be retained by early plowing and then keeping the ground fine on the surface like a dust mulch. Sometimes a mulch of strawy manure kept on through the spring on land to be used for late cabbage or celery will retain the moisture; then if care is taken to plow the ground just after a shower, the soil will show up in fine shape when other soils are very dry.—YOURS FOR A GOOD GARDEN.

Digitized by Google

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by Mrs. E. W. Gould, 2844 Humboldt Avenue So., Minneapolis

Perennials that will flower the first season if started early: Campanula carpatica, Centaurea montana, Shasta daisy, Delphiniums, Dianthus plumarius, Gaillardia, Iceland poppy, Penstemon campanulatus, Hesperis, Platycodon, Pyrethrum hybridum, Pyrethrum uliginosum, Myosotis.

Plants that will bloom in the shade: Funkia, Lily of the valley, Hazelwort, Hepatica, Trailing myrtle, Bloodroots, Monarda, Veronica, Myosotis, Sweet flag, Cardinal flower, Lychnis, Lilium elegans, Lilium parryi, Campanula latifolia, Phlox divaricata.

Plants that will grow in poor soil: Achillea, Aquilegia, Arabis, Dianthus, Perennial candytuft, Eryngium, Euphorbia, Phlox sublata, Gaillardia, Cosmos, Nasturtium, Portulaca. Planting for succession: Asters to follow canterbury bells, gladioli to follow foxgloves, cosmos to follow hollyhocks, asters to follow poppies, Shirley poppies to follow oriental poppies, annual larkspur to follow delphiniums.

Stocks, sweet sultan, cornflower, Empress candytuft and snapdragons are also good to use in second plantings.

Why Not Grow Cosmos?—Of the many beautiful flowers, few, if any, among the annuals will surpass the Cosmos for blossom or foliage. It has many desirable qualities, being free from the pest of insects, of sturdy growth, with an abundance of daisy-like flowers in white, pink and crimson and of splendid keeping quality when used as a cut flower.

Cosmos will grow in almost any garden soil if given a full exposure to the sun. The plants may be grown in groups or rows. When planting the seed, do not plant them too deep, not over one inch at most. After the plants are well established they require little or no attention until the blooming period, when the flowers should be gathered daily to insure an abundance of blossoms.

I do not reccommend the pinching out of the center or main stalk, as it has a tendency to delay early blossoms.

Many fail with Cosmos because they plant the late flowering, the seed of which comes to us from California. Generally speaking, the seasons in Minnesota are long enough to permit it to bloom. The Minnesota strain, or early blooming, will open its first flowers from the 1st to the 15th of July. The late blooming cosmos can be readily distinguished from early blooming, as the latter makes a strong, sturdy growth of thick foliage and generally does not bloom until late in October.

Guy E. Hawkins, Minneapolis.

Digitized by Google

SECRETARY'S CORNER

"WHAT CONSTITUTES HARDINESS in plants is a hard nut to crack, and the past severe winter sheds no light on the subject, as many of the so-called half-hardy varieties of tree have suffered less from the extreme low temperature of the past winter than they have for several years. Even the Thurlow willow, that has been killed back every winter for four years, shows no apparent injury at the present time. I attribute this condition to the fact that during the continued low temperature we had little or no wind."—Henry Dunsmore, Olivia.

WEALTHY APPLE SEED FOR SPRING PLANTING.—An unexpectedly large supply of apple seed has come into the office that Mr. Wyman Elliot saved from Wealthy apples grown at Excelsior. This seed has already been frozen and ought to be in good condition for germinating. Under these circumstances we are offering four times the usual amount, or 100 seeds in a packet, for ten cents per packet. There is still time, planted this season, to bring these trees into fruitage in connection with the premium offers standing, made by the society some time since, by which $100 a year will be paid until and including 1917.

PROF. HANSEN'S NEW FRUITS.—A descriptive list of more new fruits originated by Prof. Hansen at his fruit-breeding laboratory, at Brookings, S. D., being put out for the first time the coming spring, is at hand. The list consists largely of plums with Indian names, following a favorite practice with Prof. Hansen. Tokata, Kahinta, Oziya are evidently words closely related to the names he has given other varieties of his new plums. One raspberry is noted in the list and a new hybrid rose, a cross between the wild prairie rose and Siberian rosa rugosa. Full descriptions of these fruits, prices, etc. can be had upon application to Prof. Hansen.

ALBERT LEA FRUIT GROWER'S ASSOCIATION.—Under this title an organization was formed at Albert Lea on February 20th, consisting at the outset, of fifteen of the fruit growers in that vicinity, Mr. Clarence Wedge being first president and C. M. Jensen secretary. Considerable effort had been made to secure forms of constitution and by-laws from various similar associations, and reviewing the work of others along this line a constitution was adopted which seemed to meet with the needs of this particular organization. An interesting feature in their plan is that they are to use a collapsible crate in making shipments of apples, this crate we understand to be an invention of Mr. Clarence Wedge. We do not know whether he has patented it or not. Its use for this purpose is in the nature of an experiment, we understand, and may prove its adaptability for larger purposes.

APPLES AND OTHER FRUITS AT THE STATE FRUIT-BREEDING FARM.—Mr. Chas. Haralson, superintendent of the fruit-breeding farm, at Zumbra Heights, writes, under date of March 22nd., an encouraging word as follows: "I have some twenty varieties of winter apples top-worked on Hibernal and Patten's Greening, such as McIntosh Red, Black Ben, Grimes Golden, Bellflower, Jonathan and many others, which I examined before this last cold spell. I found them all in good shape, the wood was not discolored a particle, but if we get much freezing and thawing from now on, it may have some effect on them. The plum hybrids are in fine shape and will bear a heavy crop if weather conditions are good during blossoming time.

Digitized by Google

The pear seedlings which stood the winter a year ago are killed down to the snow line with but few exceptions. I examined about 1000 trees and found only two which are perfect."

BLACK WALNUT SEED FOR SALE.—Mr. B. E. St. John, Fairmont, Minn., writes me, under date of March 4th, that he has a few bushels of black walnuts grown on hardy trees in Martin County which parties can have in one bushel lots for $1.00, express or freight charges to be paid by purchaser. We are glad to advertise these valuable nuts, as this strain of hardy black walnuts ought to be generally planted in the state.

FRESH BUTTERNUT SEED.—Mrs. B. Jewell, of Dalbo, Minn., writes that she has a quantity of butternuts which have been kept moist all winter and are just in the right condition for planting, and she would be pleased to supply any of our members at thirty-five cents per peck. Dalbo is in Isanti County, some sixty miles north of Minneapolis. This should be valuable seed for Minnesota planting, and we are glad to offer it to our members.

MORE BLACK WALNUTS.—We are glad to announce that Mr. H. A. Marshall, of Shakopee, has on hand several bushels of black walnuts, having in all twenty trees in bearing. His communication does not state whether or not these are native trees, but they are evidently reasonably hardy, or they would not be producing to this extent. Mr. Marshall offers these for sale, and we hope that our members who are interested in this nut tree will secure them for planting.

RED RIVER VALLEY HORTICULTURAL SOCIETY.—This local organization has been recently revived, and gives promise of attaining even greater strength than in the past. Mr. H. J. Beardmore, of Warren, Minn., is president, and Prof. Thos. M. McCall, of Crookston, Minn., connected with the School of Agriculture at that place, is secretary. Members of the state society in that vicinity are urged to get in touch with the officers of this local association and assist in every way possible in its work.

ORCHARD AND GARDEN SPRAYING.—The Minnesota Experiment Station have just issued a bulletin, No. 121, on the general subject of "orchard and spraying". It is very complete, giving, besides a spray calendar, detailed information as to the various diseases or insects for which this spraying is to be done and formulas for preparing spraying material, description of spraying machinery and lists of manufacturers of such machinery and material. Members may secure this valuable bulletin by application to the Director of State Experiment Station, University Farm, St. Paul, Minn.

PREMIUM APPLE TREES.—The offer which the society is making of six valuable apple trees for a top-grafting experiment is still open to our membership. This offer was given in detail on the inside of the back cover of both the February and March issues of our monthly, to which members will please again refer. Something like the number to which we are limited have already made application, but we shall without difficulty secure sufficient material to extend this practically without limit we feel sure, so that members need not hesitate to make application for this premium on that account, and orders for it can be received until practically up to the time of shipment, which may be somewhere along the latter part of April. This is a very important movement that the society is inaugurating, and we hope large numbers of our members will take advantage of it.

Digitized by Google

Digitized by Google

SPLENDID SPECIMEN OF NATIVE BURR OAK, IN OAKLYN PARK, AT LAKE CITY.

Digitized by Google

☞After reading this magazine, will you please pass it along to some friend who will appreciate it and whom you may perhaps interest to become a member of the society—at least he should derive benefit from its reading. By distributing in this way the twelve magazines received during the year 1911, at the beginning of the next year—upon renewing your membership in the society—you will be entitled to receive postpaid a cloth bound volume containing all the magazines for 1911 and much other interesting matter, with a full index of all its contents, entitled "Trees, Fruits and Flowers of Minnesota," a handsome book for your library and invaluable for reference.

THE MINNESOTA HORTICULTURIST

Vol. 40. **MAY, 1912.** **No. 5.**

Seventh Year in Civic Improvement Work in Lake City.

MRS. ANNA B. UNDERWOOD, LAKE CITY.

This numbering the successive years of the work of the Lake City Improvement Club may prove disastrous in the long run, especially so to the writer, for who will care to read the reiteration of the different year's topics, 1st year, 2nd year, and so on. It reminds me of a story. A minister known for the length of his sermons, invariably gathered his thoughts under various headings, as 1st-ly, 2nd-ly, and so on indefinitely. One hot summer morning the congregation had followed him patiently through many "lys" when a sudden fierce gust of wind scattered the leaves of his sermon, taking some out of the window. A quick search, and glance out of the window, caused him to close his remarks with, "Brethren, 16th-ly, and the conclusion containing the summing up of my discourse, I see flying through the air—we will unite in singing 'Praise God from Whom All Blessings Flow'!"

I certainly incur the risk of passing into Minnesota horticultural history with the patronymic given by a crude youth to that class of novels our ancestors dearly loved, covering many large volumes. My mother used to relate the incident with great glee. She had temporary charge of a library. One day the lad came in and asked for another one of those "Toby Continued books." After looking through the catalog without enlightenment, questioning elicited from him that another volume of one of those long drawn out stories was desired, and the boy was after a "to be continued story." Thereafter in our family the expression "Toby continued" was applied to anything drawn out beyond the limit of endurance. I did not fully realize the to-be-continued appearance of my number on the program until the printed copy came to hand. Those who have a pencil may write "concluded" after I am through.

Digitized by Google

These reports have been given, in the first place, to encourage women to *start* improvement work in other places, and, next, to help them to continue their efforts from year to year.

There is comparatively little to report this season, except that the plans instituted in previous years have been carried on to a finish, and kept up in good shape. A general feeling of appreciation of the efforts made in the past prevails among the citizens, and with it all they have acquired a certain sense of responsibility that impels them to "take notice" of what is being done elsewhere.

There is an old French proverb which translated means "Nothing succeeds like success." The hard earned success of the first year has made the later work come easy. Our park board, backed up by the city council and the newspapers, unite in prosecuting whatever in reason stands for the beautifying of Lake City. The street committee was busy early and late, keeping the city's "big team" as well as several others at work grading streets and roads, surfacing where necessary with gravel and sand. Another year will see the continuation of this treatment.

Occasionally remarks will be heard, that the Improvement Club ought to take hold of work that is outside of their avowed object, such as making a grocer adopt sanitary measures in and around his store, looking after the noxious weeds and filth in back yards (very few of these now), keeping an espionage on the slaughter houses, etc. There are city ordinances covering these evils, and our club will not use its funds, time or strength to cope with them. We do use our "influence" (not yet having the right to vote) in reminding the proper official that there is something requiring attention in his department, and it is attended to.

We were organized for the purpose of making permanent improvements that would stand for all time, that would appeal to the aesthetic taste of rich and poor, high and low, good and bad—in fact, to do things whereby a common interest could be generated that in time would permeate all classes and raise the standard of thought and ambition and public sentiment. The men are leagued in various ways with the same object in view, a "Commercial Club," a "Civic League" and other organizations—whatever "boosts" Lake City mentally, physically or spiritually gets a hearing and receives encouragement if worthy. Any project pertaining to the general welfare of the community meets with the approval of all.

We have had the summer Chatauqua for two seasons and will have it next year. The managers wonder why they cannot get into the near-by cities. We feel that we *know* the reason why. These places

Digitized by Google

do not possess a *federated* club! The state federation stands for the improvement of the homes inside and outside, and for general civic advancement—which means so much for the homes—and where there is a club of women banded together and affiliated with such a state federation as we have there is an innate feeling in the heart of every member that she has the backing of every one of the many thousands of club members in the state. She knows that they will appreciate her efforts and aspiration, and this knowledge gives her the courage of her convictions, and she is ready to press on and make her best endeavor for the work she is engaged in.

The one point of vital interest to our club is to keep a fund on hand from which to draw in case of an emergency. Entertainments of different kinds—always of the best—are presented to the public and are well patronized. We have now several hundred dollars on hand as a nucleus for a bank account for next year's operations.

Last year you were told of the beginnings of "Ohuta Park." If you could see it you would realize how proud we feel of its dainty beauty; not larger than a lot in size, yet it is a charming resting spot to view the wonderful panorama of the water and landscape of Lake Pepin. From this point the view is unobstructed for many miles up and down the lake, and the ever changing lights and shadows on the bluffs and water are marvelously pleasing to an artistic eye. The old barn that troubled us so much in the past has disappeared and likewise a long woodpile. Patience accompanied by tact and moral suasion has accomplished this. The park board have acquired these water lots, and next spring will see work begun to put them in good shape. A friend in the east, interested in the various efforts of the women, has kindly offered to donate his water lots to the city to be cared for by the park board. The water lots mentioned above are largely "in the air;" briefly described, in some places there will be a strip of land only a few feet wide that is above high water mark, and in many places there is no land at all, only the shore, subject to the rise in the lake. The heavy rains of many years have washed deep gullies in the bank, many places encroaching on the road, and necessitating reinforcement with stone. The amount allowed the park board is limited, and the parks and public grounds already established must be kept up, so the extra work incurred in hauling dirt for these newly acquired lots is met by the Improvement Club—and many hundred loads are required to put them in shape. The wooden sidewalks have disappeared entirely, being replaced by those of cement, which seem to appeal to the pride of the lot owners, who begin straightway to "tidy up" their yards to match.

Digitized by Google

In the active, aggressive duties connected with outdoor improvement we must not forget those to whom we owe our encouragement and inspiration. It is a temptation in our present day rush to think that if one does his duty as he sees it he is well repaid—it was his privilege, and nothing is expected from us. We may say "thank you" in a perfunctory manner and take no further notice of the doer and his deeds. Still a due amount of appreciation shown to one giving the best of himself for the public good makes it so much easier to bear the brunt of hard work, ofttimes accompanied by sharp criticism.

During the past few years many inquiries have been received in regard to organizing improvement clubs, but in spite of urgent requests to report results only a few have responded. There must be other improvement clubs in the state, and if we could only obtain reports from them it would mean so much to those in other places desirous of inaugurating a similar line of activity. Perhaps during the coming year a personal appeal from our secretary to the many members of the Horticultural Society, might bring forth the information wanted, and in that way obtain the varied and helpful experiences of others, and also at the same time it may be possible for us to learn that there are spots on the map of Minnesota other than Lake City and the Twin Cities.

In closing these rambling remarks, I would emphasize the fact that this Horticultural Society, with its thousands of members, can wield an immense power for good. See what you have done in the past toward making fruit growing a success! The pioneers have struggled through disheartening difficulties and attained the pinnacle of their ambition in gaining for Minnesota fine fruits, etc. Now let us put our shoulders to the "wheel of progress" and strive just as strenuously for the home. Our own homes may need just a little "touching up" to make them more attractive to our boys and girls. Do we harbor unsightly places or objects about our buildings, or tolerate unpleasant conditions? I have a place in mind a few miles from my home, a good house, with lace curtains at the windows, a good barn—but the outhouses in all stages of disintegration, used by the poultry, cats, dogs and "humans." The approach to the house is covered with farm machinery, much of it worthless, which serves as roosting places for the poultry. An improvement club should be started in that home, consisting primarily of two members, later taking in the whole family.

Now this home is not yours and not mine, but is it not our duty to help such people? Neighborhood meetings, small reading clubs where some periodical like "Suburban Life," "Country Life in Ameri-

Digitized by Google

ca," "House Beautiful," "Good Housekeeping," may be read aloud and discussed—reading about artistic homes will be an entering wedge in breaking the monotony of unpleasant surroundings.

But first advise these friends to shut out the poultry from the house yard, give them the rest of the farm and orchard to roam over, but for heaven's sake keep them *out* of the houses and outbuildings, and out of the yard! Just a plain green lawn with the grass cut two or three times during a season is a thing of beauty in itself. Start with this, and the other adornments will follow. Talk this with your neighbors and get their children interested.

These rural school exhibits that are becoming so popular would make a grand avenue for disseminating this love for home comforts and beautiful surroundings. See that the children are taught to observe nature, "to hold communion with her visible forms," that they may recognize her many kindnesses. Children, and grown people, too, in the country, have many opportunities for real education and enjoyment. Poets are nature lovers, and they feel and sing of her varying moods. Hear Wm. Cullen Bryant tell of

THE GLADNESS OF NATURE.

Is this a time to be cloudy and sad,
When our mother Nature laughs around?
When even the deep blue heavens look glad,
And gladness breathes from the blossoming ground?

There are notes of joy from the hanging-bird and wren
And the gossip of swallows through all the sky;
The ground-squirrel gaily chirps by his den,
And the wilding bee hums merrily by.

The clouds are at play in the azure space,
And their shadows at play on the bright green vale;
And here they stretch to the frolic chase,
And there they roll on the easy gale.

There's a dance of leaves in that aspen bower,
There's a titter of winds in that beechen tree;
There's a smile on the fruit, and a smile on the flower,
And a laugh from the brook that runs to the sea.

And look at the broad-faced sun, how he smiles
On the dewy earth that smiles in his ray,
On the leaping waters and gay young isles;
Aye, look, and he'll smile thy gloom away.

Encourage a companionship with nature, and her many beauties will prove an open book to you, containing, as it does, numberless secrets which will be revealed to all who crave knowledge.

Digitized by Google

How a Farmer Grows Melons.

KNUTE SWENNES, MINNEOTA

To begin with, the piece of soil I grow my melons on lies in a bend of the river, where it is sheltered on three sides, north, east and west.

My method may seem unnecessarily pampering, but you must remember that the melon in its native land is almost a tropical fruit, and it requires both skill and labor to grow good melons in Minnesota.

Selection of Soil.—A black, sandy loam, not too sandy, is the best soil for melons. In the first place, the soil must be in a good state of fertility by a heavy manuring the year before planting, so there is plenty of humus in it. When I don't have the soil in the best of condition I use the following method:

For Watermelons.—Plow the same as you would for corn, and harrow well the same day to conserve moisture and keep the soil mellow and free from lumps. Then mark out the rows, ten feet apart each way. Dig a hole for each hill about two feet square and fourteen inches deep. Put one heaping scoopshovelful of well rotted cowyard manure in the hole and a shovelful of dirt on top and mix well with a fork. The hole should be filled nearly to the top, and left a little saucer-shaped to hold moisture. Pack the soil with a fork or hoe but don't step on it, as that may cause it to form a crust on top, which will hinder the young plants from coming up.

Varieties to Plant.—The Ice Cream or Peerless watermelon is the best for our locality. For a second choice would recommend the Sweetheart, which is also a very good melon but not quite so early as the Ice Cream.

For *muskmelon* I would recommend the Early Hackensack, as it possesses more good qualities than any other muskmelon I know of. It is a very choice melon, very productive, grows a fair size and does not crack open as so many other muskmelons do.

Time of Planting.—From the 15th or 18th of May up to the 10th of June.

Plant seven or eight seeds to a hill, about one-half inch to one inch deep. As soon as the plants commence to crack the soil, rake around the hills with a garden rake, or, better still, a rake made from a three-tined pitchfork. I made one from an old fork. I cut off about three inches of the points and pounded the ends flat, and bent them in the shape of a rake or hoe, and it is the best tool for hoeing melons or garden truck I ever had.

Digitized by Google

Cultivate as soon as you see the first spears of grass or weeds. Cultivate with a two-horse, six-shovel cultivator, and follow in a day or two, or even right after the cultivator, with a harrow. A small two-horse harrow that will go easily between the rows, or a large section of a field harrow and one horse will do. Don't send the hired man out to cultivate melons, but do it yourself.

If the soil is very dry it may be necessary to water the hills in order to make the seeds sprout. If you have a wagon tank, that is the best, otherwise use a stoneboat and barrel.

Loading up the melons for market at Mr. Knute Swennes'.

In growing melons there are many pests to contend with: the cutworm, the melon bug, gophers and rabbits. Last but not least, the worthless rifraff who prowl around nights and coon melons.

The best way to kill cutworms is to go over the rows in the morning, and wherever you see a cutworm has been working dig it out and kill it. The little yellow bug is not very active in the morning and at that time can easily be picked.

Shoot or trap the gophers and rabbits, while preparing the soil and planting. Gophers do much harm by digging up the seed after planting, and rabbits are very fond of melons, both while growing and after they are ripe.

When your melons are well along, so you know you will have ripe melons in a week or two, then it is time to look for a market for them. Go and see the grocers and merchants in your local town or

Digitized by Google

near-by towns, and tell them you will have some home-grown melons to sell and that you would like to supply them. Nearly every merchant is glad to get home-grown melons, as they are much better than the shipped-in ones. Sell your melons for cash, get a fair price and treat your customers well.

I guarantee my melons ripe, and if there is a green or bad melon in the lot I replace it. The man who buys with this understanding knows he is going to get a good melon, and it is much easier to sell that way.

If my melons ripen faster than my regular trade can take care of them I look to other towns for trade. If I haven't time to go and see the merchant in some other town I use the phone. If I can't sell a load of melons I offer to bring a load to be sold on commission, and they will usually take them that way. This is no risk, as the merchants are a nice class of people to deal with, and I have never found one who tried to take advantage of me.

In planting *muskmelons* provide the same as for watermelons, except you plant about six feet each way and make your holes a little smaller.

In planting a large field it is well to leave a driveway about every six rows. Make the driveway about sixteen feet wide in place of ten feet, and there will be room enough for both vines and a wagon track.

Mr. A. W. Miller: You recommend planting different varieties together?

Mr. Swennes: No, sir, different varieties will cross, and the chances are you will have a lot of worthless melons the next year. Usually that is the case where other melons are mixed in.

Col. Burnap: You didn't say anything about boys. You should tell us how to kill the robbers and the bugs.

Mr. Swennes: I did not have time in my paper to speak about that matter, but so far as the boys are concerned I take a shot gun and use a blank in it, or I go out in the evening and use No. 6 shot or rock salt. That will usually settle the boy question.

Mr. Crosby: You spoke about using rotted manure. Is not fresh manure better?

Mr. Swennes: No, it is not better; it is the finest place in the world for cutworms to hide. The manure must be well rotted in order to be successful with melons.

Mr. Grant: Is the early muskmelon you spoke of a large melon?

Mr. Swennes: No, it is of medium size; it runs from four to seven or eight pounds, which is a good size. Some are not as large as that. It is a nice sized melon for market, and also for table use.

Mr. Emmons: How many plants do you allow to mature in a hill?

Digitized by Google

Mr. Swennes: If you have two or three plants that is sufficient. I have had hills where there was only one plant, and still they ran out over the rest so that they covered the ground.

Mr. Clausen: I have had a good deal of trouble with melons cracking open, and I would like to know what the cause of that is. Another thing I would like to inquire if any one has ever tried, and that is to raise them as seedlings and transplant them.

Mr. Swennes: I have done that, but only on a small scale. Sometimes we lose a hill, and then it is nice to have seedlings to transplant. You should plant them thickly in rows by themselves, and if you have lost any hills in the field you want to give the plants which you wish to transplant a good soaking, wet them down thoroughly, but do not try to plant when the ground is too wet. When it is rainy you can transplant watermelons just as well as you can cabbage.

Mr. Baker: Do you take any soil with the root?

Mr. Swennes: Yes, I wet the plants thoroughly so I can take all the soil I want with the root, then I take up the whole hill and plant it right in the place where I want the plant to be.

Mr. Kellogg: Have you ever tried starting them in a little piece of square sod?

Mr. Swennes: No, I have never tried that.

Mr. Clausen: I have tried that for quite a number of years. I used to grow quite a few muskmelons for the market, but I only grow them for the boys now, and the great trouble I have is the cracking open of the melons, especially this summer, and I thought perhaps it was on account of the drouth. I have tried to grow them in sod and in other ways. They are very easily raised, and people with small gardens can raise them on quite a scale by starting them in flats and then transplanting them to small pots just about the time they are changing leaves. I have been doing that right along and have had very good success by planting just one plant in each pot. I use two-inch pots, and I find they are very easily handled in that way. You can plant them after most of the cutworms are gone. I think if you will try that you will succeed. I did not succeed so well where I planted them right out as I did this way.

Mr. Swennes: The splitting or cracking that was spoken of is caused by a change in the weather. If conditions are ideal almost any muskmelon will grow in any kind of a soil, and when conditions are not right it will not grow, or it will split, as has been spoken of.

In those sections which are best adapted to the growing of fruit, and where the industry has assumed a stage of great commercial importance, the gasoline power sprayer is much more generally used than any other type of spraying machine. To say that this machine has revolutionized the spraying business is literally true. Had the orchardists in our fruit sections to depend today on the old fashioned barrel and tank pumps, manipulated by hand, the high degree of efficiency possible with a modern gasoline power outfit could not be attained.

Digitized by Google

Spraying Experiments.

PROF. A. G. RUGGLES, DIVISION OF ENTOMOLOGY, MINNESOTA AGRICULTURAL EXPERIMENT STATION. ST. PAUL.

In the brief time at my disposal I thought it would be wise to confine myself to one experiment, carried on this past season by the Entomological and Plant Pathological Divisions of the Experiment Station.

The orchard used in the spraying experiment is what we call the "flat orchard" and consists of eight rows of trees, with between fifty

Prof. A. G. Ruggles.

and sixty large bearing trees in each row. This orchard does not lend itself to a good spraying demonstration because the varieties of apples are not placed in a satisfactory manner for such an experiment.

The orchard was divided into five plots, each containing about the same varieties of apples. Four of these plots were sprayed, the other plot being left as a control, or check. Three sprayings were given to each of the sprayed plots, the first at the time the buds were bursting, the second just after the blossoms had fallen, and the third two weeks later. On one plot three pounds of arsenate of lead was added to fifty gallons of the 1-30 commercial lime-sulphur; on another

Digitized by Google

plot three pounds of arsenate of lead was added to the 4-5-50 Bordeaux mixture; on another plot two pounds of arsenate of lead was added to fifty gallons of iron sulphide; on another plot two pounds of arsenate of lead was added to fifty gallons of self-boiled lime-sulphur.

My part of the experiment was to find out just what the arsenate of lead would do to the curculio and the codling moth, and whether two pounds of arsenate of lead was as good as three pounds in fifty gallons. The chart will show a few results. As the Plant Pathology Division will report later on the amount of scab, rot and other diseases, I have here simply lumped these under "diseases."

In the control plot, or check, you will notice that there was only 47.6 per cent of perfect fruit, that is, fruit that was salable. There was 17.1 per cent marked with the curculio and 6.1 per cent marked by the codling moth, the rest had some kind of disease—rot, scab, etc.

First, to note the effect of two pounds of arsenate of lead in both plots sprayed with this amount: The curculio injury has been reduced from 17.1 per cent down to 5.2 per cent in one case, and 5.5 per cent in the other case. With three pounds of arsenate of lead the injury from the curculio was reduced still further, to 2.7 per cent in one case, and 3 per cent in another.

This shows that two pounds of arsenate of lead is an excellent insecticide against the curculio, reducing the injury about 12 per cent, and three pounds of arsenate of lead in fifty gallons reduced the injury still further, making about 14 per cent of difference. Four pounds of arsenate of lead would probably decrease this small percentage of curculio injury, but it is doubtful whether it would pay to add the extra pound. It may also seem doubtful whether it would be wise to use three pounds instead of two pounds of arsenate of lead. As this is only one experiment out of a number we hope to make, this can be reported on later.

As I have frequently told many of the orchardists, the codling moth is only a secondary pest on apples in this state. You will notice in the check plots that only 6 per cent were injured by the codling moth, and that with the spraying of arsenate of lead this was only reduced about 2 per cent.

Another point that I wish to call to your attention briefly is the very promising fungicide, iron sulphide. You will note that the percentage of disease there is the smallest among all the plots, being only 15.3 per cent.

Three Pounds Arsenate of Lead and Commercial Lime Sulphur. —Trees in experiment: Wealthy, Anisim, Duchess, Hibernal, Patten's

Digitized by Google

Greening. Perfect, 63.8 per cent; curculio, 3 per cent; codling moth, 4.7 per cent; disease, 28.5 per cent. The Patten's Greening was very subject to rot. If this variety is eliminated the figures change as follows: Perfect, 72.2 per cent; curculio, 2.7 per cent; codling moth, 4.7 per cent; disease, 20.5 per cent.

Three Pounds Arsenate of Lead and Bordeaux Mixture.—Same varieties: Perfect, 52 per cent; curculio, 3 per cent; codling moth, 4 per cent; disease, 41 per cent. The Bordeaux mixture russetted the fruit considerably, and these were placed in the disease column.

Two Pounds Arsenate of Lead and Iron Sulphide.—Varieties: Longfield, Anisim, Duchess, Hibernal: Perfect, 74.8 per cent; curculio, 5.2 per cent; codling moth, 4.7 per cent; disease, 15.3 per cent.

Two Pounds Arsenate of Lead and Self-boiled Lime-Sulphur.—Wealthy, Patten's Greening: Perfect, 69.3 per cent; curculio, 5.5 per cent; codling moth, 5 per cent; disease, 22.7 per cent.

Control or Check.—Wealthy, Longfield, Anisim, Duchess, Patten's Greening, Hibernal: Perfect, 47.6 per cent; curculio, 17.1 per cent; codling moth, 6.1 per cent; disease, 29.2 per cent.

Formulas for Spraying Material.

(From Minn. Exp. Station Bulletin.)

Lime-Sulphur.—Within the last few years this wash has become very prominent. It is one of the best scale insecticides yet discovered, and will kill the eggs of plant lice. As an insecticide it has an accumulative action, being more active a few weeks after spraying than at the start. Since coming into prominence as a scale insecticide, it has been found that in its several forms it is also an excellent fungicide, and will, in many cases, replace Bordeaux mixture. There are several formulae for making this wash, three of which are appended.

The Boiled Mixture (home made):

Best stone lime, 15 pounds (not over 5 per cent impurities)
Flowers of sulphur, 15 pounds
Water, 50 gallons

Slake the lime in a small quantity of hot water, add the sulphur gradually and stir thoroughly. Dilute the mixture to 15 gallons with water, and boil in an iron kettle, or cook by steam in a barrel for forty-five minutes. Fill the vessel with water to the required 50 gallons; strain the wash through a fine-mesh strainer, and apply hot.

This wash should be applied in the fall after the leaves have dropped, or in the spring before the buds open. Spray thoroughly, covering all parts of the tree.

Formula (Concentrated):

80 pounds sulphur.
40 pounds best stone lime (90 per cent calcium oxide).
50 gallons water.

Digitized by Google

The cost of making this material will depend on the amount that can be made at one time, and the cost of material and labor. The average cost is about $2 per barrel of 50 gallons. Usually it is not practicable to make as much as 50 gallons at one time, consequently the following directions are for making only 25 gallons. Live steam run in a barrel, or fire under an iron kettle, may be used in boiling.

Place five gallons of water and forty pounds of the sulphur in the vessel, and apply heat until the sulphur becomes a smooth paste, stirring constantly. Now add ten gallons of water and twenty pounds of lime, and boil for forty-five minutes. Add water to make the twenty-five gallons. When cooled to 65° F., test with the Baume scale; the reading should be about 33°.

As a scalecide to use in the dormant season, this should be diluted 1/10 (i. e., one part of the above formula diluted with nine parts of water) and 5/10 pounds of stone lime added to every fifty gallons of the spray.

As a fungicide for summer use, dilute 1/30 (one part of stock formula diluted with 29 parts of water).

When stored away it is best to cover the solution with a layer of oil about an eighth of an inch thick. This will prevent evaporation and the forming of a crust on the material. The material should not be stored where the temperature may go very low.

In spraying with this mixture, definite dilution must be made, and to do this a Baume scale is required. The amount of dilution will vary from one part of this concentrate in nine or ten parts of water to one part concentrate in thirty or more parts of water. This concentrated material is now on the market in a commercial form, and is generally very reliable.

Self-Boiled Lime Sulphur:

Lime, 8 pounds.
Sulphur, 8 pounds.
Water, 50 gallons.

This spray is especially valuable in cases where Bordeaux is injurious to foliage or fruit. The stone fruits, such as plums, are particularly susceptible to Bordeaux injury, while some varieties of apples are badly russeted by it. There is slight danger of injury by the self-boiled lime-sulphur preparation, and it is an efficient fungicide when properly made. It stains the fruit, as does Bordeaux. In making it, 8 pounds of lime of good quality should be placed in a barrel, and enough water to nearly cover it should be added. While the lime is slaking, add sulphur which has been run through a sieve to break up the lumps. The sulphur should be thoroughly stirred into the slaking lime, enough water being added to make a pasty mass. The barrel should now be covered, in order to retain the heat, and the contents should be occasionally stirred. The time required varies with the quality of the lime; if the lime acts quickly, five or ten minutes will be sufficient, while if it acts slowly, 15 minutes may be necessary. It should not be allowed to stand too long, because it may, in that case, be injurious to foliage. Now add a little water, stirring the mixture while it is being poured in. Then add enough water to bring the total up to 50 gallons. In applying the spray it is necessary to have a good agitator in the sprayer.

Digitized by Google

Minnesota State Fruit-Breeding Farm in 1911. Annual Report.

CHARLES HARALSON, SUPT., EXCELSIOR.

The work at the Fruit-Breeding Farm has been carried on along the same general lines outlined in previous reports. Seedlings of various fruits are principally grown, some the result of hand-pollination, others from seed selected from varieties of special merit where suitable varieties have been growing close together with the object in view of having nature do the crossing work. We have many examples in this line of nature's work. Many of the best commercial varieties are chance seedlings. We have the Wealthy and Patten's Greening, the results of such plantings. Thousands of seedlings have fruited here this year, many very promising and worthy of propagation, others discarded and destroyed. During the fruiting season we went through the several blocks of plums, grapes, raspberries and strawberries, noting the improvement over the original varieties, and I believe it is possible for us to produce fruits which will be productive, hardy, of good color, better keepers, of good quality, and compete successfully in the markets of the country. We have new plums at the fruit farm which will compete with the best, but further testing as to their behavior and to avoid mistakes is necessary before they are introduced to fruit growers. The season has been very favorable, practically everything that was old enough to bear fruit having fruited. The wood has ripened up fairly well and is in good condition for winter. Many fruit buds have formed, and with a favorable spring the outlook is good for a better showing next year.

Several hundred seedling strawberries were exhibited at the summer meeting, also a good exhibit of plums and grapes at the state fair, which gave an idea of the work carried on. Nearly twenty-five bushels of plum pits have been saved to plant next spring for stock, to propagate some of the new varieties of plums which have been selected, also a great deal of seed of various other kinds, the results of hand-pollination, to be planted for fruiting. In one more season, every piece of open field on the fruit farm will have been planted. More land should be provided if the work is going to be carried on as it should be.

Mr. M. J. Dorsey has been appointed assistant in Research Plant-Breeding. Mr. Dorsey is a graduate of Cornell University and has had considerable practical work at Geneva, New York, and other stations. His work is along research lines, as approved by those in charge of the Adams' Fund of the United States Government.

Plant-Breeding.—About 250 trees, mostly Japanese and native plums, 400 strawberry plants, besides raspberries, cherries, pears,

Digitized by Google

peaches and apricots, fruited in the greenhouse last spring and summer. The results are several thousand seeds, cross-pollinated in many cases between tender varieties and our native fruits. Ten thousand strawberry seedlings were planted out in the field in July, from last winter's work, which will fruit next summer. We have about 500 trees in pots

Supt. Haralson and original tree of Burbank crossed with Wolf. Photographed May, 1911.

and tubs for fruiting in the greenhouse next spring. Several plant-breeding problems have been started; the wild rose and Rosa rugosa are being hybridized with the cultivated roses. Material is being collected to improve our native hazelnut, also our native blackberry and gooseberry, as they need very little improvement to make them valuable in the garden.

Digitized by Google

I visited Mr. C. G. Patten's plant-breeding nursery at Charles City, Iowa, November 1st and 2nd and was more than pleased with the work he is doing for the Northwest. I saw the original Patten's Greening tree, trunk nearly two feet in diameter, with, I should judge, a spread of forty feet, a healthy and magnificent tree. Mr. Patten showed me some specimen apples from several seedlings which have fruited this year. They were good keepers, some highly colored, of good quality and very showy for commercial purposes. I hope to see some of his best varieties propagated and put on the market in the near future. As we were walking through the several thousand young apple seedlings of many different combinations, I was impressed very much with the work he is doing in plant-breeding of apples, pears and plums. I do not think there is another place in this country where practical and scientific breeding is carried on on such a large scale. Very few of our horticultural friends have an idea of the work he is doing for Minnesota horticulture.

Top-Grafting.—The last two years about twenty varieties of long keeping apples, and as many promising seedlings, have been top-worked on Hibernal, Patten's Greening and Siberian crab. Among the most promising two-year-old grafts are McIntosh Red, Senator, Black Ben, Pound's Sweet, Grimes Golden and Rome Beauty. This is an experiment which will take many years to determine the best stock and the best varieties to top-work on the different stocks. It will also be necessary to have a great deal of suitable material for our plant-breeding. Next spring we intend to top-work many varieties. A great many scions are being secured for this purpose.

Plums and Plum Hybrids.—One hundred and sixty-five plum hybrids fruited last summer. Some had a full crop of fine large plums, others only a few specimens. Twenty seedlings are very promising and seem to be worthy of propagation, but further trial is necessary to determine their real value. Burbank x (crossed with) Wolf, No. 21, is an early plum, ripe August 5th this year; size, large, 1¾ inch in diameter; roundish, heart-shaped; color, deep red; skin, thin; moderately tender flesh, yellow, firm, juicy and sweet; free-stone; small pit; quality good and a good keeper; tree a good grower in the nursery. This seedling has been propagated and a limited amount of the trees will be available next fall. There are several seedlings equally as good, and perhaps better, which will be propagated next year. Among the best are Burbank x Wolf, Nos. 21, 12, 8, 23, 6, 17 and 5; Abundance x Wolf, Nos. 29, 34, 30 and 26; Satsuma plum x native plum, No. 29; Satsuma x Compass Cherry, No. 145; Green Gage plum

Digitized by Google

x sand cherry, No. 32; also a seedling of the Compass Cherry, which is of fair size and good quality; tree a good grower, with large, dark green foliage, covered with very large, white blossoms in the spring; valuable to grow as an ornamental as well as for fruit. It has been propagated this summer, and a limited number of trees will be available in the spring of 1913. A block of 7,000 Wolf and De Soto plum seedlings fruited this year. The seed was secured at Nils Anderson's place at Lake City, Minn., for this planting. Burbank, Abundance and Damson plums were growing among his Wolf and De Soto plums, the object in view being that some cross-pollination might have been done by wind and insects, but the results were unsatisfactory, only one tree being considered a hybrid. Out of the 7,000 seedlings we have selected 385 trees, which will be reduced to a few trees later on. Many have

Fruit of Burbank crossed with Wolf. Originated at Fruit-Breeding Farm.

larger fruit than their parents and qualify equal to the best of our native plums. However, I do not think we can expect very much from our native plum as a market plum. We have to get some keeping quality into them, and this cannot be done without crossing with some varieties which have this quality.

Grapes.—Beta grape seedlings bore a heavy crop this year. We picked thirty pounds from some vines. Sixty vines have been selected, and from thirty-five vines wood has been saved for cuttings to test them under propagation. Five vines were propagated last spring. A small amount of plants will be available in the spring. They are on the Beta order, probably larger bunches and berries with some improvement in quality. Out of 660 Beta seedlings there are 200 vines equal to Beta and some show a remarkable improvement over the parent, both in size of berries, bunches and quality. About 70 per cent came nearly true from seed, 20 per cent more or less hardy, and 10 per cent Labrusca type of foliage with green or bluish red grapes. Only a few vines of the Labrusca type are worth saving for future

Digitized by Google

trial. A few vines of the hybrid grape seedlings bore a few bunches this year but not enough to make any selection from. However, the plants growing are very promising. The grape-breeding at the fruit farm is one of the best experiments taken up and undoubtedly will show good results very soon.

Apples.—Owing to the fact that it takes several years to get apple seedlings into fruiting, we cannot point to any results. Some seedlings bore a few specimens each this year, but if conditions are favorable another year several thousand will fruit. The breeding of apples has been somewhat delayed on account of suitable material to work with. We have to work up our own stock. Consequently it takes time to get the trees to fruiting age. This drawback has been overcome somewhat, but more material has to be added from year to year. Breeding of apples has been carried on every year. Several hundred promising seedlings is the result of this work. From now on we will put our main effort on the apple problem.

Red and Black Raspberries.—A block of 160 selected raspberries bore a good crop again this year. Several varieties are very productive, having large berries, very hardy, and will compete with the best commercial varieties on the market. A limited stock of a few of the best varieties has been worked up, probably from 500 to 1,000 plants of each. The best of these varieties are red, Nos. 107, 2, 78, 79 and 1; purple, Nos. 86, 44 and 87; black, No. 86. Several thousand red raspberry seedlings have fruited for the first time, and many promising seedlings have been selected for further trial. The same is true of the black raspberries.

Strawberries.—Out of some 30,000 strawberry seedlings, the results of hand cross-pollination, 765 plants have been saved and are growing in trial plots with varieties like Sen. Dunlap and others, to determine their behavior as to productiveness, firmness and quality. We have some good varieties, and it is hard to decide which are the best and which to discard. Next summer, when the strawberries are at their best, I would like to have about twelve strawberry growers or experts come out to the fruit farm and select varieties to their liking. I am sure they would enjoy it very much at first, but before they were through it would puzzle them just as it does me. However, there are a few varieties which could be safely sent out on trial. A limited stock is available for such purposes. About 10,000 more seedlings will fruit next summer. Some breeding of everbearing strawberries has been done the last two years. A number of varieties have been bearing fruit all summer and fall. Berries were picked up to October 15th. On one plant I counted seventy-eight blossoms and berries, all

Digitized by Google

at the same time. Breeding of strawberries will be continued during the winter and spring, only on a smaller scale and mostly with everbearing varieties.

A clearing process of worthless seedlings was necessary this fall, to make room for new plantings and also to give promising seedlings more room. Seedlings which have been discarded and destroyed are as follows: 6,000 plum, 5,000 raspberry, 30,000 strawberry and 5,000 other seedlings. We have 1,430 selected seedlings of various fruits which have fruited the last two years, mostly controlled stock, which are being watched with much interest. At present there are about 75,000 seedlings growing at the fruit farm, besides a great deal of stock for plant-breeding.

Friend Horticulturists, it is impossible to give you a fair idea in a report like this of the details of the plant-breeding work carried on at the fruit farm without your seeing it, but I assure you we are trying to do our best for the interest of Minnesota horticulture.

Report of Committee Visiting the Minnesota State Fruit-Breeding Farm in 1911.

E. YANISH, ST. PAUL. E. A. SMITH, LAKE CITY.

(This report was made to both the Board of Regents of the State University and the Minnesota State Horticultural Society.)

Gentlemen: Having been appointed a committee to visit the Fruit-Breeding Farm of the University of the State of Minnesota, we submit the following report:

We visited the Farm October 16th. We walked over practically the entire grounds, which were in a splendid state of cultivation. Your committee are more than pleased at the results which have been attained in the short time this station has been in operation. The display of fruit at the Minnesota State Fair last September showed that already the results more than justify the investment.

Your committee fully believes that the State Fruit-Breeding Farm is one of the best investments the state has ever made. If the station succeeds in originating one late keeping apple in quality equal to the Wealthy, the state can well afford to expend more than $50,000 in improvements for and the keeping up of this station. More than this, your committee believes there will be several varieties of apples which will be added to the list of profitable, commercial growing varieties which will assist in making fruit growing in this state one of its great industries.

Digitized by Google

The crying need of the station, however, is more land. It is a penny wise and pound foolish policy to restrict the needs of this station in any way. It is being economically and wisely managed. The work carried on by the superintendent, Mr. Chas. Haralson, is practical and produces results.

We hear much of Luther Burbank's name and read about the wonderful fruit creations that have been originated through his skill, but scarce one of his creations is adapted to this northern country because of lack of hardiness. It is, then, a necessity that experiments be made in the north for the north, and there is no reason why hardy fruits cannot be grown and new fruits originated which will prove profitable to the people of our state. Your committee, therefore, recommends

View at Fruit-Breeding Farm. Field of selected strawberries in the foreground.

that at least forty acres additional of land be purchased for this experiment work. Already the entire land originally purchased, consisting of eighty acres, of which sixty-five acres are cultivated, is all of it being used. Either new experiments will have to be dropped or wait until such time as land can be cleared of the stock now being propagated for experiment purposes. It is not wise to adopt such a course.

It is a matter of common knowledge that the originator of the Wealthy apple, Peter Gideon, left a legacy to the state of Minnesota worth untold thousands. Liberal provision should, therefore, be made so that this experiment work may continue. There is every probability that his valuable services to the state may be improved upon, and the state further enriched through new varieties.

Your committee was surprised at the magnitude of the work and of the large number of promising varieties. In grapes, Supt. Haralson stated that he had some three hundred varieties which were as hardy as the Beta, and most of them superior. Think for a moment what this means, not only to the state of Minnesota but to the entire

Digitized by Google

Northwest—grapes which can be grown in quantity profitably and without covering.

In plums, on two-year-old trees fruit buds had set to the very tip, assuring a tremendous crop of fruit next year, conditions being normal. Out of these varieties there are sure to be several superior to anything we now have. A large number of trees which fruited this year have been dug up, as they were found to be no better than varieties which we now have. There is no use putting new varieties on the market which are no better than those which now exist. It is the aim of this station to improve upon varieties or else drop them, as the experiment may warrant.

Your committee believes that it would be advisable to increase the experiment in apples and decrease the continued experiment with plums, for the reason that the apple is of infinitely more importance to this northern country as an industry and as a fruit than plums can ever be, although these have their merits. Mr. Haralson told your committee that the reason he had given so much attention to plums was because they would show quick results. He has now made arrangements and has the stock so that he can increase his apple experiments. How unfortunate if for lack of ground this work must be retarded!

The greenhouse, while large enough for the present, in the future should be enlarged to meet the growing needs of the station, for it is in the greenhouse that much of the cross-pollination is undertaken, and this work is a necessity.

Your committee was shown several varieties of everbearing strawberries, some of which were in blossom and in actual fruit on the date of our visit, Oct. 16th. It may be that in the future we shall be able to grow strawberries the entire summer instead of during a comparatively short season in June.

Several varieties of pears have been grown at the station which were cross-pollenized with hardy varieties with the hope and expectation that quality, hardiness and freedom from blight would to a considerable degree be combined. Seeds of these pears will be planted, and the results watched with interest. The value of a hardy pear to this state cannot be estimated.

When you take into consideration the fact that in the U. S. report for the past ten years Minnesota has taken a high percentage rank with the leading fruit growing states of the Union, and this year she stood first, or 90 per cent, in the column of percentages, it is not rash, and does not show a lack of judgment, to report that for quality and desirability of fruit at the present time Minnesota is hard to beat and

Digitized by Google

for the future in quantity, quality and varieties she will be classed among the leaders.

The following list, as reported by Mr. Chas. Haralson, speaks for itself, and shows the great amount of work that has been done; also work which is incomplete and must be continued.

Seedlings discarded and destroyed in the fall of 1911: 30,000 strawberries, 6,000 plums, 5,000 raspberries, about 5,000 other seedlings.

The number of seedlings selected for propagating and further trials is as follows:

Twenty hybrid plums, mostly Burbank crossed with Wolf, all considered worth propagating.

Seven hundred and sixty-five selected strawberries growing in trial plats.

Sixty Beta grape seedlings; 5 have been propagated but not sent out.

Three hundred and eighty-five selected Wolf and DeSoto plum seedlings.

Two hundred and fifty red and black raspberries. A few will be propagated as fast as possible.

Crosses of various fruits growing on the farm: plums, 490; apples, 475; strawberries, 1,700; raspberries, 1,000.

Other seedlings of selected seed: Apple, 20,000; plum, 14,000; pear, 1,000; Beta grape, 12,000; other seedlings of various fruits, 20,000.

SUNSCALD is caused by rapid and extreme changes in temperature, and the more frequent the change the worse the injury. It is always found on the south side of the tree where the sun's rays strike the tree on bright days and start active life in the portion of the bark subjected to the heat of the sun. When the temperature drops again the protoplasm is killed and the soluble compounds formed by the renewal of activities then decompose. Sunscald occurs both in summer and in winter, but the damage is greater in winter because of the more extreme temperatures and the fact that the trunk is less protected after the leaves fall. It is also thought that the reflection of the sun from the snow against the bark of the trees helps to increase the injury.

SPRUCE makes the best Christmas tree. White spruce is hardy in Minn. and is also a fair grower. There is good profit and sure returns in growing it for Christmas trees. Nearly 3,000 trees can be planted on one acre, and first returns may be secured in four years after planting if the plantation be properly handled. A thinning can be made each year as the trees become large enough for market, or a part of the plantation may be cut off each year and replanted, thus insuring a constant supply.

Digitized by Google

How Can We Be of Aid in the Fruit-Breeding Movement?

M. J. DORSEY, ASST. IN FRUIT-BREEDING, EXP. STA., ST. PAUL.

The Fruit-Breeding Movement: The fruit-breeding movement has developed very rapidly in the last ten or twenty years along with the interest in the subject of breeding in general. Breeding work is not being carried forward alone with the hardy fruits of our climate but extends over a wide range of less hardy fruits for more southern regions. Considerable advance has already been made by the breeder, and it is safe to predict that in the future new varieties, with the qualities sought for, will be added to our fruit lists, chiefly through the efforts of the breeder. Fruit-breeding has been undertaken seriously because a clear insight into the situation indicates that waiting for chance seedlings, natural crosses or sports to occur, is much too slow and uncertain to meet the demands of the present. A discussion, then, of the ways in which a member of this society can assist in the fruit-breeding movement involves an inquiry into the methods by which new fruits originate.

How Do New Varieties Originate?: The methods by which our fruits have been obtained, it will be seen at once, can be grouped roughly under three heads: (1) Accidental seedlings, (2) Introductions from other countries, and (3) Varieties originated by the direct efforts of the breeder.

Source of Our Varieties of Apples: Taking the apples of New York as the basis for the following data, some idea of the influence of these factors in the origination of new varieties can be obtained. Out of 480 varieties of apples, which includes all of those of any importance of which something of their history is known with more or less certainty, 344 are chance seedlings, the immediate parents being unknown; ninety-three have been introduced from other countries; twenty-four have come direct from plantings of seed of which one of the parents has in most cases been known; three are known to be bud sports; while only sixteen have come from the direct efforts of the breeder and are crosses of known parentage or pure seedlings. Too much emphasis, however, should not be given to numbers alone, and it should also be remembered that a large number of the varieties are old, some being obsolete, and others have come to the front at a time when any attempt to breed fruits was rare indeed. A similar inventory of the northwestern apples would show a larger number of introduced varieties and also a greater number produced by the breeder.

Digitized by Google

Source of Our Varieties of Grapes: Let us take another instance, that of the grape. The following data on the grape was taken from the "Grapes of New York." We will consider 203 varieties, which includes all of those of importance commercially. Of this number, seventy-two have arisen as chance seedlings, the immediate parentage of this number being unknown, though the original vine of only forty-four of the seventy-two has been definitely located; fifty-seven varieties have resulted from plantings of seed of which one parent was known; seventy-four of known parentage have resulted from the work of the grape-breeder — a much larger number, it will be observed, than in the case of the apple. None of the important commercial varieties of the eastern part of the country have been imported, although over one-half are believed to contain some of the characteristics of the European grape to a greater or less extent.

Prof. M. J. Dorsey, specialist in Plant-Breeding, Minn. State Experiment Station.

The production of our commercial varieties of grapes is significant from the standpoint of fruit-breeding because it shows conclusively that varieties which meet the commercial demands can originate in this way. After it became generally recognized that the grape industry in this country would have to be based upon varieties of, or hybrids with, the native species, a number of men, about the middle of the last century or later, began to breed grapes. As a result, taking into account a dozen (Brighton, Campbell Early, Catawba, Concord, Delaware, Diamond, Empire State, Moore's Early, Niagara, Winchell and Worden) of the leading commercial varieties today, about ten of these may be regarded as the product of the grape-breeder. This has been the work of fifty years or so of breeding. The inference, not only with the grape, but also with other fruits, is clear. A list of plums, similar to that of the apple and grape, would, taking the country as

Digitized by Google

a whole, show a relatively large number of varieties of foreign introduction. The native plums, or hybrids with them would, of course, predominate for the colder regions of the northwest.

The lists given above of apples and grapes, setting forth the main sources of new varieties, show that there is much to be done in the way of recording accurately the history of new fruits—the date and place of origin, the originator, whether a cross, a pure seedling or open to cross-pollination, etc. These facts may be of no interest whatever to some, but the next generation, as well as any breeder doing careful work, may wish to know and may wonder why such facts were not recorded. Since coming to Minnesota, for instance, I have gotten the impression that the exact place where the original Wealthy apple tree stood is not known. If there are a dozen men in this audience who believe they could locate the spot exactly, I would like to give each a stake and see if they could go, independently, and all stick their stakes in the same place. This will serve to illustrate the difficulties encountered in writing the history of varieties. Up to the present report, for instance, I am aware of no account of the history of the Beta grape having been given before this society. There is no better place for information of this nature than our magazine and reports.

The reason for setting forth the figures relative to the origin of apples and grapes was to show that a considerable number of varieties have been found growing wild, arising as accidental crosses or seedlings. The same is true of other fruits. Anyone interested in horticulture should always be on the watch for new fruits of promise from this source. Any plum thicket in Minnesota, as well as in other places, may contain something of real merit and worth introducing. Herein lies another task for members of this society.

Testing New Fruits: An individual or an institution cannot in one spot and under one set of conditions test a variety for a whole state or country. This is a long process in most cases, and the final sifting out of the better fruits adapted to a region may be regarded as an evolutionary change, the final outcome being in many cases a change in the list of varieties grown or even a shift in the fruit-producing regions themselves. Hence, the value of trial stations.

To illustrate: The grape which is grown most in New York (the Concord) originated in Massachusetts and came into general prominence in a period of ten years or so. The Alexander apple was introduced into England from Russia nearly a century ago; the same is true of the Duchess. The Northern Spy came into existence soon after 1800, and it was nearly half a century before its value became gener-

Digitized by Google

ally known and appreciated. These instances are mentioned to show (1) that one state or country may originate varieties for another as well as itself and to point out the value and almost necessity of testing fruits extensively, (2) that it often takes a long period of years of trial before a variety eventually finds its proper place in the horticulture of a region.

Finally, the problem of bringing forth new fruits, testing varieties, keeping them true to name, recording history or, in other words, developing the horticulture of a region, is surely not so much a matter of individual effort as of co-operation. Toward developing a horticulture in the northwest much has been done, and the promising list of new fruits shown each year at fairs and society meetings is a good index of the interest in this work and shows that history is being made.

Mr. W. S. Richardson: I would like to ask whether or not you, or Prof. Hansen, or Mr. Wedge, or any one else can tell us where we can obtain top-worked trees out of any nursery.

Mr. Wedge: I do not know of any one who can supply them at this time. Mr. Patten has had quite an experience in growing top-worked trees. I think it is work that has not been very much done in the nursery.

Mr. Philips (Wis.): I tried that myself. They are very bad trees to pack, and generally a nurseryman does not care to bother with them.

The President: I think you will find the most satisfactory way is to plant a small tree with the purpose of grafting and then do your own top-working.

Prof. Hansen: I remember we tried that in Iowa many years ago, and we had that same experience, the trees were too big, and the customers were unwilling to stand the extra expense.

Mr. W. S. Richardson: Do you think it advisable to plant a young orchard with a view of top-working it rather than to plant the varieties that you want to grow in it eventually? I think it is better to plant the Virginia apple trees than to plant the Virginia crab with the idea of top-working it.

Mr. Philips (Wis.): Well, you can see the effect of that kind of work right here. I would advise any young man who wants to start an orchard—and I have given that advice several times since I have been here—to plant out at least half of his trees of Virginia and Hibernal, for the reason that if he cannot grow some choice varieties on them he can still grow apples as successfully on their own roots.

Mr. Graham: If you want to grow an orchard of Wealthy trees, is it advisable to set out Wealthy, or Virginia and Hibernal and then top-work them?

Mr. Philips: My experience will answer that question. I planted some Wealthy, nice, beautiful trees, and then I planted my Virginia and top-worked them, thirty years ago. Those that are top-worked on the Virginia are bearing today, and those that were on their own

Digitized by Google

roots are dead and gone long ago. I would plant the Virginia and top-work; it adds to their longevity and productiveness.

Mr. Clausen: There was a point in that paper about which I cannot help but say a word, and that is in regard to testing a new variety before it is sent out. I think it is an every day experience with many of us. I will just name one example in our own business. I will take for instance geraniums, of which new varieties are sent out from year to year from one place and another, and I am sure that during the last ten or fifteen years that of all the new varieties that have been sent out there have not been more than five per cent that have stayed with us. We attend these meetings, and we try to educate ourselves to educate the people, but at the same time we are all apt to make mistakes. I have sent out a box of geraniums instead of roses, but my customers know that that is not right and the mistake can be remedied, but where an apple tree is concerned that is sold and sent out, it takes five or six years before we find out what it is. When we do find out in nine cases out of ten it is too late to remedy the mistake. A few years ago a new variety of apple came out, and of course I was anxious to have it. I was very desirous to have that tree bear fruit, and when last year the tree came into bloom I was very glad because I thought I was to get fruit, but, as it turned out, instead of getting a new variety of apple, I got nothing but the old Longfield.

Prof. Hansen: I can most heartily agree with what Mr. Clausen has said. I think fruit breeders should develop a trade-mark so that we may know what a tree is before it comes into bearing. That is what I am trying to do, because if a tree bears a trade-mark we will know the first year what it is, and there will be no mistakes made. Of course, a great many mistakes are unintentional, but even whether they are intentional or unintentional we always know what to depend upon.

Annual Meeting, 1912, South Dakota State Horticultural Society.

EMIL SAHLER, WASECA, DELEGATE.

The annual meeting of the S. D. Society was held at the State Experiment Station, at Brookings. The meeting was opened on Tuesday morning, Jan. 16th, with music by the Brooking cornet band. This was followed by a number of interesting talks by visiting members, including our Wisconsin friend, A. J. Philips, and others as introduced by Pres. Krueger of the S. D. Society. Mr. C. Bartholomew, cartoonist of the Minneapolis Journal, being present at the time, there being in attendance also all of the college boys and girls, some 650, gave one of his characteristic entertainments in cartoon drawing. Tuesday afternoon Pres. Krueger read an interesting paper on "Horticultural Development in S. D.," which was listened to with keen interest. He especially urged every farmer in the state to plant more trees. This was followed by a paper on "Tomato Growing for Market," by Mr.

Digitized by Google

John Hobart of Sioux Falls, in which he claimed that his plants averaged him at the rate of $1.25 apiece in tomatoes marketed therefrom.

Mr. A. J. Philips had on display there the same exhibit of top-worked apples, thirty-two varieties top-grafted on Virginia crab, that he showed at the Minnesota meeting a month before. There was also a fine display of seventy-five varieties by Mr. Cowles, of Vermilion, S. D., and other exhibits aggregating in all about 275 plates.

Wednesday morning session opened with about forty-five in attendance. A paper was read by N. H. Dybvig on "Windbreaks and Hedges," in which he undertook to show that the evergreen was the best tree to plant for these purposes. The writer then presented the subject of windbreaks, suggesting the use of Norway poplar in six rows on the outside and within these three rows of evergreens, Colorado spruce, Black Hills spruce and White spruce.

Mr. M. Soholt, of Madison, another Minnesota member, read an interesting paper on "Evergreen Plantings for the Western Farmer." Wednesday afternoon Prof. Hansen presented the subject of new plums, in the origination of which he has had such marked success. One especially was spoken of, the fruit of which keeps thirty days after being picked, the name being Cedeca (the writer is not quite sure of the spelling of this name). Mr. Philips then talked on the general subject of top-working on Virginia crab, a subject which he had presented earlier in the season at the Minnesota meeting and full of points of practical value to the people of this region.

Wednesday evening was given up to the annual banquet, which was served by the college girls. The tables were nicely decorated and plenty of the most wholesome food was served, and in a way to give great credit to those who prepared it and to the institution that has shown them the way in which to do this. About fifty guests sat down to the table, Mr. Philips filling his usual place with us as toastmaster. Mr. Long, our reporter, was present and added his part to the entertainment, as also did our Minneapolis cartoonist, Mr. Bartholomew.

The visitors present were taken into the greenhouse and given a practical lesson in grafting, budding, etc. The visit to Brookings was made especially interesting on account of the opportunity it gave to see the work being done at the S. D. Agricultural College and Experiment Station, under the efficient management of Prof. Hansen, the host of the occasion.

Mr. Philips was honored by the S. D. Society by being made a life member, and the writer was made a member for one year. All the old officers were re-elected except the vice-president, who is this year to be Mr. John Murray, of the Black Hills.

Digitized by Google

Possibilities of Commercial Apple Growing in the Middle Northwest.

PROF. JAS. G. MOORE, HORTICULTURIST, STATE UNIVERSITY, MADISON, WIS.

In discussing the possibilities of fruit growing in the middle northwest it becomes necessary for us at the outset to give the limits of what we mean in speaking of the middle northwest. It cannot be entirely placed within the artificial boundaries of any group of states, but must be a section in which the climatic conditions are very similar. On account of this fact the section which we are to consider would include Minnesota, Wisconsin, northern Iowa and eastern South Dakota. In this area we find that the conditions throughout are very similar and because of this we can consider it as a unit in discussing the possibilities of fruit culture.

The early history of the development of fruit growing in this section is one of struggle and disappointment. The early settlers, coming from more eastern and southern states, brought with them the varieties which they had come to know as superior in the various sections from which they came. These trees were planted in the new settlements under unfavorable conditions. In the majority of instances the results were anything but gratifying. Either the trees did not thrive, or if they did by far the larger number were sooner or later destroyed by the severity of the climate. The result of these early plantings may therefore be considered largely as negative, but in negative results there may very frequently appear some positive features. This is true, for out of the early attempts at growing varieties which were brought from the east there remain some which are among the most important in commercial fruit growing in this section today, of which the Fameuse and Duchess are notable examples.

Fortunately the discouragements met with by the early horticulturist did not have the effect of stamping out his enthusiasm for fruit growing in his new environment. As the various growers met with practically the same results there came to be a feeling of sympathy and general interest in the cause, which resulted in renewed vigor being put into the work, and from which has accrued results which are clearly evident at the present. One of these results is evidenced by the meeting which is being held here today. We find that these early growers banded themselves together into societies for a general discussion of the best methods to be employed in overcoming the difficulties which they encountered. Out of these mere local societies came each of the great state organizations which for enthusiasm and

Digitized by Google

good work performed are the peer of any in the country, for it is only where there is a common cause that enthusiasm and co-operation can be brought to the highest point.

Finding that they could not rely upon the eastern varieties these pioneer horticulturists started out with the avowed purpose of securing varieties which would be capable of withstanding the conditions which they had found to exist. With a common starting point we find the work leading along two widely diverging lines, both of which have led to affirmative and very important results. One was the importation of varieties from regions having even more severe climatic conditions than those prevailing in this section, and from this work we have secured such varieties as Longfield and Yellow Transparent. By far the greater, and to an extent the more productive, work was that of producing adaptable varieties. Nearly every horticulturist was interested in the production of seedlings, and from the thousands produced there have been picked out here and there those of superior merit until there has been built up a list which gives a very considerable range for the selection of the fruit grower. The horticulturists of no one of the states has been alone in this work. This state gives the Wealthy, Wisconsin boasts of being the home of the McMahon, while Patten, of Iowa, brought out Patten's Greening and other varieties which have added much to the prospects for commercial apple growing in the middle west.

Prof. Jas. G. Moore.

Thus we find that the early history of apple growing in this territory was primarily a period of experiment, most of the work being done by the pioneer, who with courageous heart and steadfast purpose was laying the foundation of a commercial apple industry for those who were to possess the inheritance he had builded for them through many a struggle and discouragement.

Digitized by Google

The period of experimentation is not closed. We have no right to accept the legacy of the pioneer and turn it to our advantage without doing all we can to improve the conditions. We may never be able to do as much or at least secure such marvelous results as the generation just past, nevertheless we have a duty to perform as well as they, and unless we perform that duty to the best of our ability succeeding generations will rightly accuse us of being an ungrateful and negligent generation of horticulturists. The legacy the pioneer horticulturists left us was a list of varieties adapted to our climatic conditions, our legacy to succeeding generations should be an established commercial apple industry.

Are there insurmountable difficulties which will prevent the establishment of such an industry? If we were to talk with a fruit grower of New York or of Oregon, he would doubtless tell us that there are, for there is a prevailing idea that the conditions in this section are unfavorable for commercial apple growing. There is but one method of telling whether such is the case, and that is to analyze carefully the conditions as they exist, and then from our analysis draw a conclusion either in the affirmative or in the negative.

The development of a commercial apple industry depends upon four factors, soil, climatic conditions, available market and the man. The question which arises then is, does the middle northwest possess these requisites?

Soil.—The former belief was that everything in fruit growing depended on the soil. We have come to believe that the soil is not the only factor in successful fruit raising but still a controlling one. No matter what the other conditions are, the soil must either be adapted or capable of being corrected so as to become adapted, or else the project is a failure. The day is passed when commercial orchards can be put on any kind of soil as was the home orchard of forty years ago. Not all the soils in the section under consideration are adapted to fruit growing. Neither are all the soils in any particular state, whether in this section or any other. For the growing of apples a clay loam or gravelly loam with a fairly porous subsoil is the type of soil which is usually considered best adapted to the production of this crop. It is true that in some sections certain types of sandy soil are being used with success, but this type of soil requires much greater attention and a larger expenditure in keeping it in suitable condition for the production of a paying crop. If we were to study the soil map of the states mentioned, we would find that the middle northwest contains a sufficient area suitable for apple growing on which to develop an apple

Digitized by Google

industry many times larger than that now possessed by any similar group of states. The lack of suitable soil then cannot be offered as an excuse for the lack of a commercial apple industry.

Climate.—The chief argument used by those who claim this region cannot become a commercial apple section is that the climatic conditions are such as to make it impossible to grow the apple successfully for commercial purposes. The inception of this idea was from the failure of the pioneer to grow unadapted varieties on unadapted soil. Are we to take the failure of the early fruit growers as the final word relative to commercial apple growing in the middle northwest, or has the wrong deduction been made from their failure? What is the true significance of their failure? Is it that we cannot grow apples or that we should learn, as other fruit sections have learned, that we should not expect to grow all the varieties, whether adapted or not? The early fruit growers learned that they could not and set about securing varieties which they could grow as well or better than any other region. Is the New York grower discouraged because he cannot grow as good Ben Davis as Missouri, or the Michigan grower because he cannot grow Jonathans to compete with the Oregon product? Should the Minnesota or Wisconsin grower then be discouraged because he cannot grow King, Northern Spy or Baldwin as does Michigan or New York? If we look over the range of varieties which are adapted to commercial culture in the section under discussion we will find that we are no more restricted than any other commercial section. Our Wealthy, Duchess, McMahon and McIntosh are not surpassed by those grown in any other section. In addition to this there are several other varieties which may be called into use.

But we do not even need to stop here. The possibilities of adding new varieties which will fill in the vacancies which now occur in our list are greater today than ever before, because the principles and laws governing plant-breeding are now better understood than in the past. New varieties are constantly being added. I have only to mention the Gem City, which has recently been given attention by your society, and the Dudley, which has been placed among the important varieties in Wisconsin, in proof of this statement. If our climatic conditions permit of growing such varieties successfully, why should we consider unfavorable climate as our excuse for the lack of commercial fruit culture?

Available Markets.—One of the chief questions which is troubling the man who contemplates a commercial orchard at the present time is the probability of over-production, due to the recent large plant-

Digitized by Google

ings in so many sections. A careful study of the situation will convince one that the probability of over-production is very slight, but that there may be certain sections which will apparently have over-production because of the lack of proper distribution. I think we are safe in asserting that with proper distribution there is little or no probability of over-production, at least of any but the extra fancy grade of fruit. If, then, the question is that of proper distribution, the matter of the distance of shipping will be one of paramount importance. This question of distance from the market is of great importance to the commercial apple grower.

The apple, being the most cosmopolitan of fruits, is grown over a much wider range than other fruits with the result that at least some of the product is produced near by the majority of the great consuming centers. A difference of a few cents per unit in the cost of transportation may, then, mark the difference between being able to secure a remunerative price in any given locality or in not being able to ship to that market. How does the distance between the available markets of this section compare with those of other apple growing regions? We can possibly point out this comparison better by giving a few figures than by any other way.

Hamilton, Montana, the central point of the famous Bitter Root Valley, lies 1,000 miles from Minneapolis, 1,300 miles from Milwaukee, 1,400 miles from Chicago. The approximate distance from Oregon points to the same markets are: 1,500 miles from Minneapolis, 1,800 miles from Milwaukee, 1,900 miles from Chicago. The Minnesota grower, however, has to ship his fruit 50 to 100 miles to Minneapolis, 350 to 400 miles to Milwaukee, 400 to 500 miles to Chicago; and the Wisconsin grower approximately 100 to 300 miles to Minneapolis, 25 to 200 miles to Milwaukee, and 150 to 400 miles to Chicago.

The New York grower who desires to put his product on these markets has the following distances to ship: 500 to 600 miles to Chicago, 600 to 700 miles to Milwaukee, and 1,000 miles to Minneapolis. Those of Virginia and West Virginia must ship about the same distance. Taking the average distance to these market points, which constitute the chief ones for the middle west, we see that, compared with the grower of the middle northwest, the Oregon grower has from ten to fourteen times as far to ship, the Bitter Root seven to nine times, and New York and Virginia three to five times. Michigan is the only state which is at all comparable, and even her distances are greater for the average shipment.

Owing to this proximity to the markets and therefore the lessened cost of transportation, this section should be able to hold nearly an

Digitized by Google

exclusive trade with its standard varieties in Milwaukee, St. Paul, Duluth, Minneapolis, Superior and cities in the iron region, and a large trade in any of the comparatively large cities of the section. As to the availability of markets no apple section of the country possesses more favorable conditions for an outlet for its crop than the section we are considering. Markets, then, are not an excuse for not building up a commercial apple industry.

The Man.—If the other three essentials for successful commercial apple orcharding are not responsible for the future development of such an industry in the middle northwest, then the grower must be held responsible. I do not believe we are ready to admit that the fruit grower of these states is not equal in intelligence and energy to those of any other section. Wherein, then, does the failure lie? To get at the reason for the present situation let us look at the history of the development of a commercial fruit section. In this consideration we must exclude the west, because its development has been along radically different lines than that of the east. The development of the east and middle west has been identical. The fruit finding its way into the markets in the main has been the surplus fruit from the farm orchard. So long as conditions were not too adverse the farm orchardist was able to produce a fairly creditable quality of fruit, but as soon as the trees grew older, the pests more numerous and the fertility of the soil declined, quite the reverse was true. It was not until this condition came to the point where the fruit of a section was becoming a reproach to the section that a commercial industry developed. Wisconsin, Minnesota and northern Iowa have been passing through the stage of the home orchard, and today stand at the threshold of a commercial apple growing industry. *The home orchard as a producer of market fruit must go, or the home producer must reform.* Conditions have changed, and practices must change to keep pace with the changed conditions. What is the cause for the present ascendency of the western grower? Not flavor, not superior conditions of soil or climate, not more natural blessings, but because he makes apple growing his business, not a side line. This is a day of specialization, and a man to be a good fruit grower must grow fruit as a business. We have no criticism of the pioneer in his orchard practices, for he lived up to the approved methods of his day. But we do severely criticise the orchardists of today, either "farm" or "commercial," who follow the same methods the grower of fifty or even twenty-five years ago followed. No man but is blameworthy in fruit growing who does not keep abreast of the times in the matter of the production of the highest grade of marketable fruit. His failure is not alone his, but it affects deleteriously

Digitized by Google

every man who offers fruit on the market, and it matters not whether the neglect is of orchard spraying, pruning or the marketing of his crop.

With abundance of suitable soil, a list of adapted varieties as large as any commercial section, and with a demand sufficient to take many times the amount now produced, with markets and market facilities surpassed by no other fruit growing region, with growers who grow fruit as a business, not as a side line to dairying, grain raising or other business, there is no conceivable reason why this region, once despised as an apple growing section, should not take its place among the foremost sections of the country as a producer of fine appearing, first class apples of quality unsurpassed by none and equaled by few sections of the country.

Mr. Beebe: In view of the fact that Mr. Underwood is not present this morning to speak upon this subject, I wish to say that the thought uppermost in my mind for the past few days has been regarding the method of marketing our fruit. I find we can sell in Lake City to advantage, but here in the city the market is carried on to the advantage of the retailer and the commission man, and not of the consumer, because we are not represented here. Almost no man who grows fruit can afford to accompany his fruit here. I have not thought particularly of preparing a resolution upon this subject, but I think this society ought to take it up and consider it and set some means going by which to properly market our fruit. I understand that Long Lake and Excelsior have successful associations, and there are such associations in other sections of the country, but that they are not strong enough to have an organization of such associations under which they could have representation in the cities. Now I want to inquire if we cannot have a federation of fruit growers' associations which shall employ a man who is capable of disposing of our fruit. I would like to hear some expressions of opinion upon this subject.

Mr. Husser: Would it not be a good idea to form a sort of central bureau in the Twin Cities in connection with the retailers of the West and the North, and also in connection with apple growers. Of course, apple growers have got to learn to pick and pack their fruit properly, and then it can be sent to a central bureau where it can be sold for them. Would it not be a good plan for the Horticultural Society to take this matter up?

Digitized by Google

Winnipeg Horticultural Society, Annual Meeting, 1912.

PROF. LE ROY CADY, ST. ANTHONY PARK, DELEGATE.

It was my privilege to attend the Winnipeg Horticultural Convention as a delegate February 15 and 16. The meetings of this association were held at the Agricultural College, a few miles out of Winnipeg. Coming as it did during the Bon Spiel meeting and just following the regular Agricultural Short Course at the College, the meetings were not as well attended as they should have been, but they made up for this in the interest and enthusiasm of the members present.

This society so far has really been one of three horticultural societies in Western Canada, and an effort was made at this meeting to combine these into one strong horticultural society, and it was partially successful. The numbers presented were all exceedingly interesting, and the discussions resulting from them were very profitable. The convention opened Thursday afternoon with a program given by the women's section. This included papers on the growing of bulbs, herbs and ornamental flowers generally.

Mr. Norman Ross, Superintendent of Forestry, Indian Head, gave an illustrated address on ornamental planting in connection with the farm. This was illustrated with lantern slides, showing what had been done on the experiment station at Indian Head. The plants that seemed best adapted to the work were cottonwood, Manitoba maple (our ordinary box elder), and among the evergreens, the white spruce.

Following this program in the afternoon, the Domestic Science Department of the college served tea to those in attendance. This was very nicely done, showing that the young ladies are getting good training, even though this department has been established but a year or two and is working in very cramped quarters. Your delegate was entertained at dinner with the faculty of the Agricultural College, residing on the grounds. This numbers about fifteen or twenty and is made up of individuals from various parts of the United States and Eastern Canada.

The evening entertainment was largely popular addresses, one by the principal of the Agricultural College, a lantern slide talk by your representative, and an illustrated address on colored photography by Prof. Lee, of Agricultural College, Winnipeg. Some very interesting slides were shown in the natural colors of the flowers.

Friday forenoon was given up to the market gardeners and some very excellent papers on the growing of cucumbers and other vegetables were given at this meeting. We found about the same list of vegetables recommended for planting as is generally recommended in

Digitized by Google

Minnesota. Mr. H. C. Whellams, Louise Bridge, Manitoba, presented a very able paper on cucumber growing. He has made a specialty of pickle raising for several years and has been very successful. For his picking of the plants and some other work he uses Gallician women. He obtains an average crop per acre of twelve to fifteen tons, getting as high as twenty tons occasionally. He applies to this land about twenty to twenty-five tons of manure per acre.

D. W. Buchanan, formerly a nurseryman west of Winnipeg, but who has sold his nursery and is about to move into Winnipeg, gave a short resume of experiments in horticulture for Manitoba, giving somewhat of his experience lasting for a number of years.

The afternoon was given up to discussion of horticultural and forestry problems. The most of our standard plums seem to do fairly well in Manitoba. Apples are much more difficult to raise, and it seems that they, as well as some of the other fruits, must be developed for that particular section. There has been a great advance in all lines of horticulture, especially the protection of farmsteads and the ornamentation of farmsteads in Western Canada the last few years. We find that all sorts of vegetables grow there in abundance and of excellent quality. There are a few greenhouse establishments in the city of Winnipeg, but most of the vegetables and flowers come from east and south. We noticed Minnesota mushrooms, rhubarb, lettuce and radishes on the market.

This society, while not large in numbers, under the careful management of the president, Dr. H. M. Speechly, has done an excellent work the past year, and the prospects are that this year will see a considerable advancement along horticultural lines.

The writer regretted very much that Prof. Broderick had gone east a few days before the meeting on urgent college business, so that he was unable to be at any of the horticultural sessions.

The Agricultural College is fortunate in that, since it has nearly outgrown its present quarters, an arrangement has been effected whereby it removes to another district a little further from Winnipeg, but where it will have a section of land and somewhere in the neighborhood of a million and a half to two million dollars to start anew with. It means that they can use the experience that they have had the last few years in starting a new plant that will be a decided improvement over their present one, and they will be able to build for greatly increased activities and usefulness for the future, something that does not come to very many state institutions.

Digitized by Google

THE VEGETABLE GARDEN

Seasonable Notes for May

By H. J. BALDWIN, NORTHFIELD

Let us look to the hot-beds and cold frames a bit before we take up the outside gardening.

Great care must be taken these summer days so that the plants have plenty of air and moisture. One of the most common mistakes made is in over-crowding the plants, either by transplanting too close or by sowing seed too thickly. The early radish or lettuce will be cut out, and a succession should be planned for either more of the same, or the vacant place works well to put tomatoes in up to the 20th. Or cucumbers can be forced nicely. I have found it profitable to start muskmelons in old berry boxes, allowing them to grow there for about four weeks. By wetting the plants freely before transferring to the field, the boxes are readily cut away without disturbing the roots, so that a good stand can be looked for. This same process works well with cucumbers and summer squashes. A few hills of early tomatoes can occupy the beds for the summer and are usually earlier than those in the field.

The cold frame space comes in fine for starting the field cabbage and celery plants, for they are usually in a position where they can readily be watered. About the 15th of May will be the best time for sowing Holland cabbage and the late cauliflower. The late celery can be transplanted from the seed bed or boxes to the cold frames for a few weeks until fit to set in the open field.

If proper care is taken by way of cultivating and running the wheel hoe, a large per cent of the hand work usually done can be dispensed with. I have found in the care of potatoes that by cultivating and running the weeder alternately, they can be kept clean without any hand hoeing.

This is the month for corn planting and care. By using a small one-horse 8-inch plow to open a shallow furrow, the corn can be planted a little below the usual depth, and as it comes up the weeder or drag will keep it clean for some time. I usually plant but one way and usually only four rows at a time; then wait a few days before planting again, thereby giving a succession of prime green corn until heavy frosts. If only one or two rows are planted at a time of one kind, it will not pollenize well and the corn will husk out poor and irregular ears.

At least every ten days through the month, a planting of succession peas should be made.

A few Dwarf Horticultural beans planted along with the wax variety will work in well for early green string beans; then for succcotash as they ripen, and if any remain use as lima beans during the winter.

The fight with insect pests will commence this month, but we will reserve this subject for another number.—YOURS FOR A BUSY MONTH.

Digitized by Google

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by Mrs. E. W. Gould, 2644 Humboldt Avenue So., Minneapolis

NOTICE OF MEETING.—The Garden Flower Society will meet in the Mayor's Reception Room, City Hall, St. Paul, Tuesday, May 21st, at 2:30. PROGRAM: 1. Paeonies, Mrs. F. X. Ferodowill, Spring Park. 2. Five minutes talk on "Growing and Arranging Flowers for Exhibition." Minneapolis members and friends will meet at the Minnetonka Station, 17 No. 6th Street, taking 1:45 o'clock car. All members are invited to bring friends.

A WHITE BORDER.—Bocconia cordata, spireas, white hollyhocks (followed by white cosmos), hyacinthus candicans, achillea, white phlox (both annual and perennial), white lupins, white foxgloves, white canterbury bells, white lilies, iris, garden heliotrope. When the blooming season of the above has passed, cut back and fill in with the following white annuals: stocks, sweet sultans, cornflowers, empress candytuft, snapdragons, asters, gladioli and sweet alyssum.

GOOD COMBINATIONS.—(1.) Columbines with white sweet rocket. (2.) German iris and syringa larkspurs with white Japanese iris and lilium candidum or hyacinthus candicans. (3.) Formosum and belladonna larkspurs (delphiniums) with coreopsis and calendulas. (4.) Garden heliotrope and oriental poppies. Keep all magenta shades as far as possible from all other colors except white.

The Minnesota Garden Flower Society is especially interested in growing seedling roses. We are, therefore, very fortunate in being able to publish these directions, written especially for us by Mr. Charles Haralson, Supt. of the State Fruit-Breeding Farm, at Excelsior, who has grown them successfully.

RAISING SEEDLING ROSES.—The rose is the queen of flowers where it it can be well grown. Our climate is too severe for best results, consequently only the hardiest varieties can be grown successfully with the average rose growers, and then only with careful winter protection. The rose has been bred for generations to almost a perfect flower at the present. It is only lacking in hardiness for our severe winters.

Very few of our best varieties will set seed, and if they would very little would be gained by growing seedlings from such varieties. Some years ago hybridizers and rose growers began to recognize the Rosa Rugosa as a hardy type to breed from; a few standard varieties of this type which are giving much satisfaction appear in the nursery catalogs. I will mention a few, such: Madam Geo. Bruant, Conrad F. Meyer, Madam Ballou, Henry Gravereaux, Madam Labori and Madam Ancelot. If the seed is saved and seedlings grown from such varieties, we may get hardier kinds.

Every lover of roses should set a few plants of our native wild rose, which is very ornamental when given care and cultivation, also the Siberian form of Rosa Rugosa, which is much hardier than the French strain. With this material growing in your rose garden, it would be easy for anyone to become an expert plant breeder. The Rosa Rugosa or the wild rose should be used as the mother plant.

Digitized by Google

Here are a few directions as to how to go at the breeding of roses would be proper. *Method of emasculation.* Select a bud which is ready to burst open. The anthers should be removed with as little injury to the flower as possible, a sharp knife or a pair of small scissors being the proper tools. When the operation has been performed, the emasculated flower should be enclosed in a paper bag so there will be no danger from the action of foreign pollen. Pollen should be selected beforehand from such varieties as Gen. Jacqueminot, Madam Gabriel Luizet, Frau Karl Droschky and any others you wish to cross with.

Applying Pollen to Pistils.—The quickest way to apply the pollen to the pistils is to use a small camel's-hair brush. This operation should be done from twelve to twenty-four hours after the bud has been emasculated.

I would like to see every lover of roses take up this breeding problem. The results would be very interesting to the society. We have a number of roses at the fruit-breeding farm, the result of such crosses. Some are quite double, free bloomers and perfectly hardy without winter protection. More of this work will be taken up when time permits. I do not see any other way to grow perfectly hardy roses from seed.

Taking Care of Seed.—The seed pods should be picked when ripe, the seed removed and mixed with moist sand. It should be stored away in a cool place, (a cellar will do) until cold weather begins, when it can be buried outside for freezing over winter. Care should be taken so that the sand and seed do not dry out. The seed can be started early in the spring, in a cold frame or in the garden, where they will make good, strong plants by fall. If seeds are given plenty of room, many bushes will bloom the first summer, but generally the second year will show the character of the seedling.

In looking over notes on rose seedling combinations of Rosa Rugosa crossed with Gen. Jacqueminot, I find about thirty-five per cent more or less double, the remainder single; nearly all show more or less the Rosa Rugosa type of plant and foliage.—Charles Haralson.

Attention, Fruit Growers!

THE MINNESOTA FRUIT ASSOCIATION.—*What is it?* It is a purely co-operative central marketing association formed only for mutual advantage of its members.

Who may become members? Individual fruit growers and local bona-fide co-operative fruit-growing associations within the territory embraced by the organization, each member paying an annual membership fee and agreeing to use the services of the association to do his marketing.

How is the association to be managed? By a continuous board of seven directors elected by the members.

Is it a good thing? Other local and marketing associations are making good every day. Apply for membership and see it make good for you.

What information is needed by the association? The name and address of *every fruit grower* in the state of Minnesota- and in writing do not fail to give this information: number of apple trees in bearing, names of varieties, age of trees, estimated probable crop of apples in 1912. Upon receipt of communication, full information will be given as to all the details and working of the association, with which without question every fruit grower in the state should be connected.

Address K. A. Kirkpatrick, Manager, University Farm, St. Paul, Minn.

Digitized by Google

Digitized by Google

BLOSSOMING TIME IN F. W. KIMBALL'S TOP-WORKED ORCHARD, AT AUSTIN, MINN.

Digitized by Google

☞After reading this magazine, will you please pass it along to some friend who will appreciate it and whom you may perhaps interest to become a member of the society—at least he should derive benefit from its reading. By distributing in this way the twelve magazines received during the year 1911, at the beginning of the next year, upon renewing your membership in the society you will be entitled to receive postpaid a cloth bound volume containing all the magazines for 1911 and much other interesting matter, with a full index of all its contents, entitled "Trees, Fruits and Flowers of Minnesota," a handsome book for your library and invaluable for reference.

THE MINNESOTA HORTICULTURIST

Vol. 40. JUNE, 1912. No. 6.

Is the Catalpa Worth Planting in Minnesota?

CLARENCE WEDGE, NURSERYMAN, ALBERT LEA, MINN.

The catalpa as planted in the United States is of three species. The catalpa is a native of wide distribution, being found in the hills and river bottoms of most of the southern states. The Catalpa Kempferii is an importation from Japan, and the Catalpa Speciosa is a native whose habitat is restricted to the river bottoms of the lower Wabash river in Indiana and down the Ohio and Mississippi rivers as far south as New Madrid, Missouri.

The Catalpa Catalpa is a spreading, dwarfish tree producing large quantities of seed in clusters of four to six pods and altogether tender and unfit for northern planting. The Catalpa Kempferii is also a dwarfish tree of upright habit, with much smaller leaves than the American species, producing seed with great freedom in clusters of eight to twenty small thin pods, and hardy enough to make a desirable tree for ornamental planting in Minnesota.

The Catalpa Speciosa is a strong growing forest tree of upright habit, having large leaves and producing seed very sparingly, seldom more than two pods in a cluster. Its heart-wood, when properly seasoned, is very durable in contact with the soil and is generally acknowledged to be one of the best of timbers for posts, ties and telephone poles. In its native bottoms the largest trees attain a height of over one hundred feet and a diameter of six feet.

There can be no doubt of the great economical value of the last named species over all that part of the country to which it is adapted, so that the question forming the title of our paper is narrowed down to the discovery of whether the tree is adapted to the climate of Minnesota. This would be a comparatively easy matter if it were not for the fact that there are not only three species involved in the investigation but also that these three species readily hybridize with one another.

Digitized by Google

And even after clearing up these difficulties, we have also to make allowance for the well observed fact that the true Speciosa is inclined to break up into strains of varying hardiness. We believe that there is almost as much variation in the hardiness of the Speciosa as there is with the varieties of the cultivated apple. Mr. Patten, the well known plant breeder, writing under date of November 16, 1911, says: "I know of no forest tree so susceptible of improvement as the catalpa, as is indicated by the range of variability in the hardiness of its seedlings, which is nearly as great as that of the seedlings of the cultivated apple. On rich, well drained lands from Des Moines to St. Paul, I should think it a safe proposition to plant the best strains of the catalpa as a timber tree. I have a tree at my house that must be about fifty feet high and nearly eighteen inches in diameter, at three feet from the ground, a typical forest tree."

I have had all three species on my grounds at Albert Lea, besides trees that were evidently of hybrid origin. Some fifteen years ago I secured seed of a large tree of particularly good form and apparently great hardiness from the city of Albert Lea, and from this stock have grown trees that are seldom killed back more than an inch or two, and that show a surprising uniformity of growth. One of them planted near my office door ten years ago is over thirty feet high, with a diameter of nine inches breast high, and without crowding has formed a central stem as straight as an arrow. Some specimens of this strain were injured in the April freeze of 1910, the only material injury that I have observed during the past ten years. I have seen trees in the Minneapolis parks that five years ago were forty feet high and eighteen inches in diameter, showing every evidence of health and hardiness. There is a grove of mixed trees some six miles south of Albert Lea in which the catalpa was planted some twenty years ago. The catalpas have kept up with the other soft wood trees and have, I think, made rather more timber on the average than most of them. Mr. Latham, the secretary of our society, writes us from Minneapolis as follows: "There are in this vicinity certain specimens of the catalpa that have the appearance of being perfectly hardy. Descendants of these hardy trees, of which I have one planted on my own place some twelve years ago, we have, I believe, the right to expect will survive at least the average Minnesota winter." The variation in the behavior of the catalpa depending upon the source of seed is well illustrated in a recent letter received from Henry Flyen, of Dawson, Minn., from which I quote quite liberally, as his experience is out on the open prairie in the latitude of St. Paul, only about twenty miles from the Dakota line.

Digitized by Google

"I set out fifty catalpas in the spring of 1906. I have not lost any of them nor have they at any time frozen back much, most of them only to the second bud. They have had no cultivation, and that is probably the reason they have made but a slow growth. They are now some of them twelve to fourteen feet high and bearing seed. I do not know of any one else that has had the success that I have had with them. One party bought several thousand from an Illinois nursery and has plowed most of them up, and the rest do not amount to anything. Another party that planted the same time I did, setting them out as an avenue, lost all of his trees. There are also trees at Louisberg and Clarkfield that freeze back in winter. My catalpas are fully exposed to the west and south. I believe that by taking seed from hardy trees we can in time get catalpas that will endure our winters as well as some of our native trees."

As near as I can discover, the best strains of the catalpa now cultivated in Minnesota have come to us from Iowa, where, many years ago, Mr. Suel Foster, of Muscatine, the father of catalpa culture in the west, grew and disseminated what appears to have been a type of tree of unusual excellence.

My own opinion of the catalpa is that the best strains which may now be secured by gathering seed from select Minnesota trees will make useful ornamental trees all over Minnesota and profitable timber plantations south of the latitude of St. Paul. It seems to me altogether unreasonable to take the fact that thousands of catalpa trees planted without reference to their origin or character have proved worthless in Minnesota as establishing the standing of the tree in our state. This was precisely the ground taken in regard to orcharding twenty-five years ago, when the great bulk of the apple trees planted were being consigned to the brush pile, and when the Duchess, Wealthy and Hibernal were but little known and their special adaptation little understood. The most dependable sign of a good strain of catalpa is the disposition of the trees to make a straight central stem. The other important features are large, long pods, produced either singly or with only two in a cluster, a large leaf and blossom, bark rather deeply ridged instead of smooth, as in the Kempferii, or partially so, as in the southern catalpa. The size of the seed pods will, however, always vary widely with the season, and the leaf is smaller in the mature than in the young trees.

For timber plantations a thoroughly good, rich soil should be selected. Catalpa is an exceedingly unsatisfactory tree in a poor soil. A sheltered situation is very desirable, not for protection in winter but

Digitized by Google

to prevent the unusually large and tender foliage from wearing itself out in the violent summer winds. The trees should be planted as close as four feet each way, should be cultivated as thoroughly as a cornfield until they shade the soil and then promptly thinned as they crowd each other. The plantation will be much more valuable if cut back to the ground after growing one or two seasons. The trees should then be trained to one shoot per tree, which will make a fine, straight growth of six to ten feet the ensuing season. If the trouble be taken to allow but one shoot to grow in the tops of these, in the following spring the grove will be filled with trees having straight, clean boles eight to twelve feet high, making the most useful timber for posts and poles. In good, rich soils the catalpa increases in diameter at the rate of about an inch a year for the first ten years, after which the growth is much slower. At the St. Louis Exposition catalpa railroad ties were shown that had been in continuous service on the Louisville & Nashville R. R. for thirty-two years and were still in fairly sound condition. As fence posts it has lasted eighty-five years, as fence rails eighty years and as telegraph poles thirty-two years. Indeed, its durability in contact with the soil is far superior to the white oak and only exceeded by the red cedar. Like other timbers, it is only the heartwood that possesses such durability. But there are few trees that form heartwood as quickly as the catalpa, and such wood is as durable if quickly grown as when grown slowly. The outer two or three rings only will be sappy, while in the bur oak there is usually twenty rings of sap.

Another strong point in favor of the catalpa as a timber tree is the readiness with which it renews itself from the stump when a plantation is cut over. By thinning to the strongest sprout the grove will soon reproduce a stand of trees as good or better than the original growth.

The catalpa is readily grown from seed, which may be gathered at any time before the pods open in March and kept in a dry place till the time of sowing, which should not be earlier than May 1st, as the seedlings are very susceptible to injury by frosts. We sow in beds four feet wide, covering with only about one-fourth inch of soil and giving a light mulch of marsh hay to prevent drying out. On the first signs of germination this hay is removed, and the beds carefully watched and watered, if necessary, till the seedlings have taken root. If a good stand is secured the labor of weeding will be slight, as the trees soon shade out everything beneath them. The catalpa may also in some seasons be readily grown from cuttings, by which method a hardy strain can most certainly be perpetuated.

Digitized by Google

Developing the Commercial Orchard.

EXERCISE CONDUCTED BY MR. HAROLD SIMMONS, FRUIT GROWER, HOWARD LAKE.

Mr. Harold Simmons: This being a question and answer exercise, I am not expected to say anything to you in a formal way, but you are supposed to ask me questions, and I am supposed to answer them if I am able to do so.

Mr. Grant: What stocks have you used in top-working?

Mr. Simmons: I have used Whitney No. 20, the Virginia crab, the Peerless, the Patten Greening, and some others, but the Virginia seems to give the best satisfaction.

Mr. Gardner: Have you had any trouble with the Peerless with the limbs splitting?

Mr. Simmons: They grow too straight to be likely to split in the crotch.

Mr. Husser: How do you like the Whitney No. 20?

Mr. Simmons: It does very well.

Mr. Gordon: Would you recommend the Virginia for any part of the state?

Mr. Simmons: I would think so.

Col. Burnap (Iowa): I think we should be a little cautious pretty close to the line of Minnesota and half across the state, because the Virginia body blights with us quite a good deal.

Mr. Simmons: I have a great many Virginia, but I have no blight.

Col. Burnap: Your being situated between two lakes has a good effect upon your trees with regard to blight.

Mr. Simmons: I don't think so. Blighting is due to a climatic condition, due to heat and moisture in the summer time.

Col. Burnap: Yes, they are apt to blight more after a shower of rain and the sun comes out strong.

Mr. Grey: Will you please describe the difference between sunscald and blight?

Mr. Simmons: Blight is a bacterial disease, but sunscald is caused by the sun in the early spring drawing the sap to the surface of the bark, and when the sap is up and it turns cold suddenly it freezes, and the bark of the tree will crack.

Mr. Grey: The bark extends away from the wood.

Mr. Simmons: Yes, it will so that the bark will come off from the trunk.

Mr. Husser: What is the best remedy?

Mr. Simmons: Protect the trunk of the tree.

Mr. Bubak: How does wrapping the tree with burlap do?

Mr. Simmons: Burlap is a good protection against rats and mice, but it would not have a good effect to use against sunscald. The best remedy in sunscald that I have found is to grow a low headed tree so that the limbs will shade the trunk.

Digitized by Google

Mr. Bubak: I have had good luck in protecting trees by sharpening a board at one end and driving it in on one side near the tree and leaving it there until spring. That will protect the trunk of the tree against the direct rays of the sun.

Mr. Flanders: I go to work and take a bundle of hay—where there is no danger from mice—and I tie it on the trunk so that it will shade the body of the tree. That is the way I protect my trees, and so far it has worked all right.

Mr. Jenson: I protect mine by tieing on cattails.

Mr. Simmons: That is a good idea.

Mr. Husser: How long would you head a tree?

Mr. Simmons: Two and a half feet from the ground; that makes a good height.

Currants growing in orchard of Lyman's Prolific crab at Harold Simmons, Howard Lake.

Capt. Reed: Don't different varieties require a different height of trunk?

Mr. Simmons: I would not think so from my experience. In growing a tree with a low head it is a great advantage in picking the fruit, but it is also likely to make you crawl around on your hands and knees to accomplish the same thing.

Mr. Husser: What distance apart would you recommend planting a commercial orchard?

Mr. Simmons: Twenty-five feet.

Capt. Reed: Have you fruited the McIntosh Red on its own root?

Mr. Simmons: The McIntosh Red is not good here except top-worked. The tree is not hardy. I planted fifty trees four years ago, and I lost forty of them this last winter (1910-11).

Digitized by Google

Mr. Clark: Where is the best place to plant an orchard?

Mr. Simmons: A northeastern exposure.

Capt. Reed: That is an old theory.

Mr. Simmons: My place is located on a northeast slope between two lakes, and I doubt whether anyone can find a better location for an orchard than I have there, both from a practical and theoretical standpoint.

Capt. Reed: My trees are on a south slope, and they do better and grow better than they would in any other location.

Mr. Olson: Is there any objection to sowing alfalfa in the orchard?

Mr. Simmons: It would deprive the trees of the necessary moisture in the summer time. Alfalfa is a deep rooting plant, and it takes too much of the needed moisture away from the trees.

Mr. Husser: Are those lakes that you have on each side of you located in such a way that you notice that they protect your orchard from frost?

Mr. Simmons: Oh, yes; the orchard runs right down to the foot of the lake.

Mr. Husser: There is quite a difference between an orchard so situated and one where there is no water close by.

Mr. Simmons: It is generally so conceded, but from my practical experience I have never noticed the benefit. I know in the case of small fruits my neighbors are generally a little ahead of me, a day or two, and I presume it is owing to the proximity of the lake to my place.

Capt. Reed: Was your fruit damaged by frost in 1910 the same as that of your neighbors?

Mr. Simmons: Yes, it was badly damaged, but at the same time my neighbors had hardly an apple while I had over three hundred bushels.

Mr. Bubak: Do you grow strawberries on your place on this same ground?

Mr. Simmons: Yes, all small fruits.

Mr. Bubak: Didn't you see any difference about the water keeping the frost off the blooms?

Mr. Simmons: Only this, I have noticed that mine are two or three days later than those of my neighbors in season.

Capt. Reed: Do you cultivate your growing orchard?

Mr. Simmons: Not regularly. I cultivate a year and miss a couple of years, just enough to prevent the trees from becoming sod-bound.

Mr. Jones: How old is your orchard?

Mr. Simmons: The oldest orchard, of three and a half acres, is ten years old.

Mr. Anderson: Would you recommend continuing cultivation after an orchard has come into bearing?

Mr. Simmons: Well, it has not been generally advocated to cultivate orchards here on account of the blight, but it is the generally accepted theory that everything grows better for cultivation, that it

Digitized by Google

thrives better with cultivation than without, and I am of the opinion, based on my two or three years' experience, that it is better to cultivate a growing orchard.

Mr. Benjamin: How long would you cultivate during the season?

Mr. Simmons: Up to the last of July or first of August.

Mr. Granger: Where you have five or six feet of mulching, would not that be sufficient to take the place of cultivation?

Mr. Simmons: I would not think that would answer the same purpose as cultivation.

Mr. Husser: Have you any winter apples that are doing well?

Mr. Simmons: I have the Northwestern Greening, the Malinda, and the best winter varieties that we grow in Minnesota.

Mr. Brown: Take old trees, some that have been planted a number of years, how deep should you plow the ground?

Mr. Simmons: Five or six inches, enough to turn the sod under.

Mr. Husser: Have you any plums?

Mr. Simmons: Yes, sir.

Capt. Reed: What is the average life of a plum, and can its productiveness be increased by cutting out limbs?

Mr. Simmons: Yes, plum trees after four or five years' growth generally bear the best crop, and after they are three of four years old the limbs should be trimmed in order to keep up the productiveness; they need to be cut back in order to keep up a new growth.

Mr. Husser: How long can you keep them bearing?

Mr. Benjamin: We have some on the place that are twenty-five years old and are still in good condition and bearing fruit.

Mr. Carson: How far from the end do you trim plums and what sized limbs?

Mr. Simmons: In some instances you have to cut the whole growth back in order to get a new growth, and wherever they grow too long and spindling you want to trim them off there.

Mr. King: I saw one of my neighbors trim his plum limbs off close to the body of the tree, and he has had hardly any plums since. He cut off some large limbs.

Mr. Husser: Will root sprouts coming up from a plum tree kill the tree?

Mr. Simmons: I would not think so.

Mr. Husser: I took some sprouts up that were growing around a tree, and the tree seemed to be dying.

Mr. Simmons: I would not think so unless in taking up the sprouts you get too close to the tree, and prune the roots of the tree too severely.

Mr. Husser: The root runs out from the tree and branches off, and the sprout comes up from the root. I should not think that that would make any difference.

Mr. Simmons: I have a question here that has been sent to the secretary's office, and the questioner wants to know whether there is an apple orchard in the state of Minnesota that has been or is being thoroughly cultivated. I do not know of any, but if there is any one here who knows of such an orchard in Minnesota that is being cultivated I would like to have him make it known.

Digitized by Google

Mr. J. M. Underwood: I suppose there are very many people here who have heard me a great many times exploit the subject of cultivation. I hope I shall not make you people tired talking upon that subject. I do not intend to talk merely to have my own way, I do not intend to be extreme or inconsistent in any of my talks on this matter of cultivation, but after losing a good many thousand trees I commenced to study fruit growing, which was a side issue with me—that was not my business—as I thought if I told people to plant trees I ought to be able to demonstrate how it ought to be done. As I said before, that was a side issue with me. I did not know very much about it at the time. I watched my men, and I went to work and commenced to study the subject. I talked with people who were intelligent in growing fruit in large quantities, and I thought I had made a mistake in not cultivating my trees, and then I went on to cultivate them thoroughly. I went and talked with some of the foremost orchardists in the east, and then I talked with orchardists in Missouri and California, and those that seemed to be the most successful and intelligent growers of fruit all agreed that the clean cultivation of orchards was the only thing to do. I visited Mr. George S. Powell, of New York state, who is probably the foremost horticulturist in the east and in the middle states. He has a large commercial orchard near Albany that I visited, and I was particularly anxious to get his views with regard to cultivation. I had studied it out myself that that was the thing to do, but I wanted to confirm my views and experience by the experience and observation of other men, and I did not want to make a mistake in going at it again. I could not see any good reason why a tree should need attention when it was young and had not fruited and then should cease to need attention when it had grown old and had to go to work to bear a crop.

If you have a nice span of Percheron horses that are going on five or six years old and you are going to put them to hard work next spring, you ought to take a little better care of them when they are colts and growing up than you would if they were never intended to do any work at all. When they were colts and growing up you took the best care of them, but when they go to work it is no longer necessary to feed and water them in order that they may do the hard work required of them. That is the position so many people take with regard to our fruit trees. They will take the best care of trees while they are young and growing, but just as soon as an apple tree gets into bearing they will seed down that orchard and give the trees no more attention. I do not know what percent of an apple is moisture, but it is made up mostly of moisture. The whole nub of the thing is to furnish moisture. If you will get that fixed in your mind, that the greatest trouble in growing trees of any kind is the want of the proper amount of moisture, you will succeed in nine cases out of ten. Give them a drink! Don't choke them to death! That is what I did before I knew any better, but now we are giving our orchard water in the way of intense cultivation. I have not had any grass grow in my orchard I don't know for how many years. I feel so positive that it is the only true principle upon which to grow an orchard that I think

Digitized by Google

it is the next thing to a crime to hear people say the best thing to do is to seed down an orchard.

Mr. Simmons: Do you use cover crops to supply the necessary humus?

Mr. Underwood: Two of our orchards are close to town, and we have two teams hauling manure the year around, and in the winter time we draw out manure and just cover the ground with coarse manure.

Mr. Andrews: What kind of soil is your orchard on?

Mr. Underwood: We have a black loam, a little sandy, with a clay subsoil. We have an orchard in sand with a little mixture of clay, and after that the sand goes down a hundred feet deep.

Mr. Andrews: How old are your trees?

Mr. Underwood: Some are twenty-five years old.

Scratching the surface early in the spring, anticipating a dry season. A view in Harold Simmons' orchard at Howard Lake.

Mr. Sahler: How old were they when they first came into bearing?

Mr. Underwood: A good healthy tree usually bears two years after planting, but of course you can't expect a small tree to bear a bushel or a barrel of apples; it will have to get some size.

Mr. Anderson: Are not the conditions where your orchards are located different from the conditions a hundred miles west, in the prairie region, where you have a black soil with a clay subsoil?

Mr. Underwood: The soil may be different, but the condition of the moisture is about the same. What I am pleading for is more moisture, no matter what the soil may be. If your land is wet you

Digitized by Google

ought to drain it. I do not say that you ought to cultivate every orchard, because there is such a thing as supplying too much moisture. Out here in Excelsior they have orchards growing good crops that are seeded down to blue grass. If there is too much moisture the ground ought to be tiled. However, I don't care what the condition is, a tree in order to do well must have moisture, and if it is doing well the ground is moist. Out at our experiment station at Excelsior, Mr. Haralson informs me that some of their soil is so wet that they have to tile it; they have to drain it. There is a difference in soils, and you have to use your judgment in regard to giving your trees proper treatment. If you have the moisture that is all you need. Notwithstanding the fact that some of those orchards that are seeded down are doing well and bearing a great deal of fruit, I imagine that if those hidebound orchards were to be done over and the sod broken up in order to let the sun and air get into the surface of the soil, it would help the trees very materially. I am not prepared to tell you anything about any particular orchard I do not know anything about, but I am simply giving you my experience that I learned by hard knocks, and which is amply confirmed by successful and intelligent orchardists who have had a like experience.

Capt. Reed: Are you troubled with blight on your sandy land?

Mr. Underwood: We have had very little blight in any of our orchards since we commenced the system of cultivation. I will not say that it is cultivation that has prevented blight, but the fact exists that we have but very little.

Mr. Francis Willis: Are you near water?

Mr. Underwood: No, sir.

Capt. Reed: Don't you find it difficult to cultivate trees after they get to be some ten years old?

Mr. Underwood: We use what we call a spading harrow with knives that go down and cut up the soil, and we can spade an orchard right through with that.

Capt. Reed: Is it a cut-away harrow?

Mr. Underwood: We have both the cut-away and the other kind that we call the spading harrow, which we deem preferable for our work.

Mr. Yanish: Will you tell us how you cultivate your orchard you have on a north slope?

Mr. Underwood: We cannot cultivate that orchard; we would if we could, but it is so steep we cannot cultivate it to advantage, and it is not necessary to cultivate that orchard because it is on such a steep northern exposure that the sun and wind does not strike it so much as it would a southern exposure, and for that reason there is more moisture there, and it naturally holds a more even and a cooler temperature. The soil in this side hill orchard is good, it is mostly clay with a little mixture of sand and lime rock, so that all the conditions of moisture are supplied in that orchard, and that is the thing that I have been talking about. We spade around those trees and give them cultivation in that way every year. We have a large space around each tree which we spade over in summer, and sometimes we

Digitized by Google

mow flax or wild grass and throw it on the ground around the trees to keep the moisure from evaporating from around the trees.

Mr. Benjamin: How close to the trees do you spade.

Mr. Underwood: We spade right around the tree and dig little channels on the side hill in order to draw the water to the tree.

Mr. Benjamin: Do you ever have trouble growing trees with hired help?

Mr. Underwood: No, not much. We do not have much trouble in that respect, because when we do set a man to work we have a foreman with him, or with the men that he works with, and it is his business to see that the work is done right.

Capt. Reed: Does not a heavy mulch have a tendency to draw the moisture to the surface of the ground?

Mr. Underwood: That is just the thing I want to speak about. I think I can tell you all there is to know about that feature. We had quite a small orchard of crab apples of different kinds, and I thought that here was something I could use for an experiment, so I went to work and mulched the orchard. I mulched it heavily. I did not cultivate it, but I kept a very heavy mulch on and that was continued until nearly every tree in that orchard died. The explanation I have to make of the matter is that it brought the roots so close to the surface that they would not stand the winter.

Mr. Sahler: What did you mulch with?

Mr. Underwood: Coarse manure. I do not believe mulching in that way is a success. I want to tell you how mulching, and what kind of mulching, probably is a success. Two men here, Mr. Ludlow and Mr. John Howard, are probably two of the most successful orchardists in Minnesota. Perhaps Mr. Howard will tell you that he does not cultivate, but he has the finest system of cultivation that can be developed, to my mind. He fences his orchard with hog wire fence, throws the manure out and puts it in piles in his orchard, and then turns his hogs in and they root up the manure, but they kill out all the grass, and he gets just what his orchard requires, that is, he gets moisture. Mr. Ludlow tells me that he does not cultivate but hauls the manure out and dumps it down in big loads around the trees, and then he says he has eighty hogs running in the orchard. I think that is the finest way of cultivating an orchard that can possibly be devised, and I think Mr. Howard will bear me out when I say it will take about two hogs to the acre to give that kind of cultivation, and that will bring the water to the surface where it is needed, and that is what we want for an orchard.

Mr. Sahler: Do the hogs keep away from the trees?

Mr. Underwood: They do not seem to hurt the trees; anyway you all know Mr. Howard gets fruit.

Mr. Benjamin: A tree can be protected by driving stakes around it.

Mr. Underwood: I think it is almost a crime to tell horticulturists to seed down their orchards. It draws the water away from the trees, and they do not get the benefit of the moisture that they ought to have.

Digitized by Google

Capt. Reed: Does that mean trees of any age?

Mr. Underwood: The whole thing is a matter of the want of water. It does not make any difference whether your trees are young or whether they are old trees—a hundred years old. I have a cousin living near Palmyra, New York, whom I visited some time ago, and he had sold his orchard of a hundred Baldwin apple trees because he thought he never made anything from them. I told him I would rather have the profit from those apple trees than from all the rest of his farm. He is getting from his Guernsey herd of cattle only two and a half cents per quart for his milk. Yet he was not doing anything with those one hundred Baldwin apple trees. About seven or eight miles from his place there lived a man by the name of Youmans, and Mr. Youmans had two sons. The father is quite an old man with grey hair, and his boys look after the farm, they are making a specialty of growing fruit for export. I visited their orchard with my cousin, and I asked Mr. Youmans if there was anything for a man to do there, or whether he would advise him to go west. He said, "Well, I don't know what else he can do, but I know he can raise Baldwin apples." I said, "Would you consider it profitable to grow Baldwin apples here?" He said, "Why, certainly I would." I stepped on my cousin's toes because he was a man with some great large trees twenty-five to thirty years old and getting nothing from them just because they lacked care. In this Youman's orchard there is not a weed, it is just as clean as thorough cultivation can make it, and they raise fruit and export it, and they make it pay.

Mr. S. D. Richardson: Don't turn the hogs into your orchard if you don't want the same experience I had. They got more apples than I did because they could jump up and reach for them where I could not get hold of them.

Mr. Sahler: If you will let them in a Hibernal orchard they will not touch them. (Laughter.)

The President: Mr. Underwood has been giving us some very valuable advice. I do not believe that we can expect to get a crop of apples, a good crop of apples, and continue to get good crops of apples and expect our trees to stand the climatic conditions, unless we feed the ground and cultivate the ground about the trees. We cannot expect to get good fruit and lots of it any more than the farmer expects to get corn if he does not cultivate it. You will get some apples if you do not cultivate, and the farmer will get some corn, but you will increase the crop and you will strengthen the trees and lengthen their life by cultivation.

A good method of strengthening a weak crotch is to run an iron rod through the two limbs which form the undesirable crotch. A hole is bored through the two limbs a short distance above the crotch. This hole should be made to fit the rod as nearly as possible; this hole will not injure the tree. The rod should have a large head at one end and be threaded for a large nut at the other. The rod is inserted and the nut screwed up tightly. A one-inch rod will support a tremendous strain, but the size will depend, of course, upon the size of the limbs to be braced.

Digitized by Google

New Methods in Combating the House Fly.

PROF. F. L. WASHBURN, STATE ENTOMOLOGIST, UNIVERSITY FARM, ST. PAUL.

In our efforts to protect ourselves from house flies, which have resulted in screened windows and doors and screened porches, it has not occurred to us that we are making prisoners of ourselves and leaving the flies free to multiply in enormous numbers, thereby increasing the dangers of infection from typhoid and other diseases. The thought first occurred to a member of the family of Dr. Hodge, of Clark College, Worcester, Mass., that we were working on a wrong principle, and this thought, emanating from a boy, was put into practice in our

Fig. 1. The Out-door Fly Exterminator, finally adopted and now on the market. On left, attached to garbage can; middle figure shows ring by which it is attached to can; right hand figure attached to its own large bait box. Flies can enter trap from top of can, or cover of can may be made to fit loosely, allowing flies to gain access to garbage and thence enter the trap through opening in can.

fight against these dangerous insects. As the boy said, "Why not put the flies in jail and let ourselves out?"

This is quite a revolution in our campaign against the house-fly. Its efficacy is based upon the fact that there elapse somewhere from nine to fourteen days from the time that the female fly emerges from the pupal case and the time it lays its eggs. It is evident that if a systematic trapping is carried on in this period before the first brood lay their eggs, and there is co-operation upon the part of the people in the neighborhood, the number of flies in that vicinity would be appreciably decreased. This theory works out in practice.

Two firms in Worcester are manufacturing approved forms of fly traps which can be used in a variety of ways with great success. They

Digitized by Google

can be suspended from a hook; they can be attached to a garbage can, to stable window screens, or screens in slaughter houses, and so arranged as to catch flies going in or coming out.

It is strange that this did not occur to us before, for it appears to be the most sensible thing in the fight.

The offering of prizes to children for bringing in the greatest number of flies between certain dates, a proceeding which has been very popular in various cities recently, while it may reduce the number of flies in a certain district of any town where the campaign is waged vigorously, fails in its ultimate object and is based upon an entirely wrong principle, for it is to the interest of children and others collecting for prizes to increase the number of flies rather than decrease

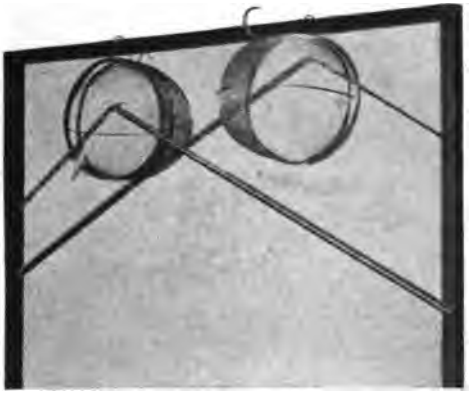


Fig. 2. Exterminators set with guide strips on window screens, for cellar stable window; catches them going and coming, all that hatch inside and all that try to get in; could be used also on dairy or garbage shed windows, slaughter houses, etc.

them in order that they may get more prize-bringing material. Not only that, but it has resulted in sending children into districts more or less contaminated with disease germs, and into the neighborhood of filth with which they would not ordinarily come in contact.

All hail, then, to this new method of fighting the house fly! It does not mean, by any means, the abolishing at once of other protective methods, and we will still screen our houses, at least for some time to come, and cover our garbage pails carefully, do away with all filth as far as possible, and cover or remove the waste from the stable. Sticky fly paper and the use of formalin and water as a poison drink, with numerous other remedies, will still continue to be practiced and should be made use of if we wish to keep our children, as well as ourselves, out of danger.

We illustrate herewith this new fly trap, which sells, we believe for about 25c. The reader will note the large, generous bait box. The best bait apparently is a mixture of bread and milk.

Digitized by Google

Henry Shaw and the Missouri Botanical Garden.

PROF. L. H. PAMMEL, AMES, IOWA.

Mr. Henry Shaw will be known to future generations for two gifts, one the donation of Tower Grove Park to the city of St. Louis, a beautiful park adorned with a large number of handsome trees and shrubs; and the other the Missouri Botanical Garden, generally known as Shaw's Garden, but modesty made him hesitate to have it called after himself. In both cases he had in mind, I presume, that the institutions were to be public, and hence he thought it would be better not to have his name attached to either institution.

In one of the clauses of the will of Henry Shaw he states that certain property shall be conveyed to trustees of an institution, chartered by the Missouri legislature, to be known as the Missouri Botanical Garden "for the object and with the view of having for the use of the public a botanical garden easily accessible, which should be forever kept up and maintained for the cultivation and propagation of plants, flowers, fruit and forest trees, and other productions of the vegetable kingdom; and a museum and library connected therewith, and devoted to the same and to the sciences of botany, horticulture and allied objects" for all time. The said trustees shall also have the power to establish public lectures upon botany and its allied sciences. In order to bring the Garden into close connection with Washington University, he provided an endowment of a school of botany, and to secure harmonious co-operation "I require that the professor or professors in said school of botany shall be either the director of the Missouri Botanical Garden, or the person next to him in rank." Furthermore the trustees, whenever they think expedient, may allot from time to time any of the income not needed for the development and maintenance of said garden, means and appliances, for instruction and the erection of another building. He stipulated also for instruction of Garden pupils in practical and scientific horticulture and aboriculture. It was further stipulated that scientific investigations in botany proper, in vegetable physiology, the diseases of plants, the study of the forms of vegetable life and of animal life injurious to vegetation, experimental investigations in horticulture, aboriculture, etc., are to be promoted no less than instruction to pupils.

Mr. Shaw saw the need of bringing men of science together, and therefore he bequeathed $1,000 annually for a banquet to be given to the trustees and the guests they might invite, and another banquet to the gardeners of the institution, florists, nurserymen and market gardeners of St. Louis and vicinity. A sum of $500 was bequeathed for premiums or prizes to a flower show or exhibition. He made a further

Digitized by Google

provision in his will that an annual sermon be preached in such church and by such minister as the bishop of the Episcopal Church of the diocese should select. These bequests have all been fulfilled.

It will be seen from the above that the provisions in this will call for the establishment of a great botanical garden and an institution for botanical and horticultural work. The larger part of this great estate was left to endow an institution which in its scope of work will be equal

Henry Shaw, founder of Shaw's Missouri Botanical Garden.

to the best botanical institution of the world. Even the far-famed Kew Gardens, of England, are not laid out on broader lines. One is naturally interested to know how Mr. Shaw came to outline so comprehensive a plan.

Mr. Shaw was born in Sheffield, England, July 24th in the year 1800. His primary education was obtained at Thorne. His fondness for plants seems to have started from his early childhood days. At Mill Hill he received some education in the classics and mathematics. He studied French, German, Italian and Spanish, but French was his favorite, in which he was an excellent scholar, speaking, reading and writing it with as much ease as English. He seems not to have had any special training in botany, but he undoubtedly was a keen observer, as I can attest from my conversation with him when he was well up in the eighties.

Digitized by Google

His career, in brief, was as follows: He came to Canada with his father in 1818; the same year he went to New Orleans, but not satisfied with this climate he went north to the then French trading post, St. Louis, arriving there on May 3, 1819. With a small stock of English cutlery he started in business. He was his own housekeeper, tended strictly to business, not, however, omitting pleasures; he cared little for society. His business grew, not only in the vicinity of St. Louis but was extended, as he told me, to the trading post of Prairie Du Chien, and then to Ft. Crawford. The then dominant element of St. Louis was French. In 1839 he found that his balance sheet showed a gain of $25,000, and he resolved to go out of business. At the age of forty, he was worth $250,000, a large sum in those days. In September, 1840, he went to England, returning in the autumn of 1842. The same year he went again, remaining three years, going as far east as Constantinople and Egypt. In 1851 he went to England for the last time. Perhaps on these trips the idea grew to establish a garden, since the house in Tower Grove (now in the garden) was built in 1849, and while apparently a man of leisure he was indeed a busy man and remained so until a few weeks before his demise, which occurred on August 25, 1889.

In the establishment of the Garden he was assisted in many ways by Dr. George Englemann, a leading physician of St. Louis, but who is known best in the scientific world for his botanical contributions, which are counted among the best American taxonomic papers of the time. Mr. Shaw commissioned Dr. Englemann to examine botanical gardens and museums and get suggestions for the Missouri Botanical Garden, which was established in 1859. Mr. Shaw frequently asked the advice of Dr. Asa Gray, the distinguished botanist of Harvard University, on whose judgment and that of Dr. George Englemann he relied in planning this great institution.

In order that the botanical work might begin, Mr. Shaw established the Henry Shaw School of Botany, as a department of Washington University, which opened its doors on September 17, 1885. Dr. William Trelease, a graduate of Cornell University and professor of botany in the University of Wisconsin, was called to fill the Engelmann Professorship of Botany. Dr. Trelease has rendered botanical science distinguished services as the guiding and controlling hand in the affairs of this school and the Missouri Botanical Garden.

Mr. Shaw desired to have a close connection between Washington University and the Garden, which occupies a unique place among similar institutions of the world. It has, I believe, the largest private endowment and the finest botanical library and laboratory under one roof in the United States. Its future certainly seems bright.

Digitized by Google

After a service beginning in 1889, Dr. Trelease has recently resigned. During all this time there have been heavy responsibilities on the director in successfully guiding a new institution and increasing the productive income. Dr. Trelease has shown himself not only to have been an excellent director from a business standpoint, but the annual reports have shown him to be a man unusually well qualified to carry out the intentions of the founder of the Garden. The amount of research work he has done is large considering the executive duties he had to perform. The many scientific papers of the director are of great importance.

The progress of the Garden is shown in the creation of a school for Garden pupils with endowed scholarships. Some of these men are holding responsible positions as horticulturists, landscape architects and gardeners. The Garden has been an aid to many men and women in research work. A large number of important contributions have been made by them. That portion of the Garden devoted to the North American flora arranged synoptically is a unique feature of the Garden.

The number of species growing in the Garden is 12,000. This may not seem to be a large number, but when these plants must be labelled and taken care of it means much labor. The herbarium contains 700,000 specimens and is one of the largest herbaria of the United States. This includes the priceless Engelmann Herbarium and many minor collections.

The library contains 70,000 volumes, largely botanical. It is one of the best appointed botanical libraries in the world.

In addition to the annual volume and scientific papers issued by the Garden, Mr. Henry Shaw, before his death, paid for reprinting the scattered botanical papers of Dr. George Engelmann. These were edited by Dr. Asa Gray and George Engelmann.

The Mississippi Valley should have a peculiar pride in the garden founded by Mr. Henry Shaw, as it is more than a local Missouri Institution. If the same wise and conservative policy prevails, the Missouri Botanical Garden is sure to be of commanding importance botanically to the people of the United States, and the wishes of the founder will be realized.

Mr. Thomas Dimmock, his biographer, says:

"A life, prolonged far beyond the ordinary term and full of active effort almost from beginning to end, was singularly uneventful 'keeping the noiseless tenor of its way' from birth to death with little to break, nothing to seriously disturb, its even current. He was a public man only through his labors for the public good."

Digitized by Google

Fruits for Minnesota Planting.

List adopted by the Minnesota State Horticultural Society, Dec. 6, 1911, for the guidance of planters in Minnesota.

Apples.

Of the first degree of hardiness: Duchess, Hibernal, Patten's Greening, Okabena.

Of the second degree of hardiness: Wealthy, Malinda, Anisim, Iowa Beauty, University, Lowland Raspberry, Jewell's Winter, Milwaukee.

Valuable in some locations: Wolf River, Yellow Transparent, Longfield, Northwestern Greening, Tetofsky, Peerless.

Most profitable varieties for commercial planting in Minnesota: Wealthy, Duchess, Patten's Greening, Okabena, Anisim.

Varieties for trial: Eastman, Evelyn, Windsor Chief.

Crabs and Hybrids.

For general cultivation: Florence, Whitney, Early Strawberry, Sweet Russet, Transcendent.

Varieties for trial: Faribault, Dartt, Success.

Plums and Hybrids.

For general cultivation: DeSoto, Forest Garden, Wolf (freestone), Wyant, Stoddard, Terry.

Most promising for trial: Compass Cherry, Hanska, Opata, Sapa.

Grapes.

First degree of hardiness: Beta, Janesville.

Second degree of hardiness: Moore's Early, Campbell's Early, Brighton, Delaware, Worden, Concord, Moore's Diamond, Wyoming Red.

Raspberries.

Red varieties: King, Turner, Miller, Loudon, Minnetonka Ironclad, Sunbeam.

Black and purple varieties: Palmer, Gregg, Older, Columbian, Cumberland.

Blackberries.

Ancient Briton, Snyder, Eldorado.

Currants.

White Grape, Victoria, Long Bunch Holland, Pomona, Red Cross, Perfection, London Market.

Gooseberries.

Houghton, Downing, Champion, Pearl, Carrie.

Strawberries.

Perfect varieties: Bederwood, Enhance, Lovett, Splendid, Glen Mary, Clyde, Senator Dunlap.

Imperfect varieties: Crescent, Warfield, Haverland, Marie.

Native Fruits.

Valuable for trial: Dwarf Juneberry, Sand Cherry, Buffalo Berry, High Bush Cranberry.

Nut Fruits.

Shellbark Hickory, Black Walnut, Butternut.

Digitized by Google

(Discussion on the adoption of Fruit List at the annual meeting.)

Mr. Busse: I would like to ask the committee on fruit list why they put the Wealthy way back in the second degree of hardiness. Why should it not be put in the first degree? I have not seen or had a Wealthy apple tree killed within the last twenty-five or thirty years. It will discourage people from planting the Wealthy, and it should be planted more than ever before. The committee has also put the Peerless in the third degree of hardiness, and I would like to ask any member of the committee, or anyone else here, if they have ever seen the Peerless killed in the north or in the middle west states fruit belt?

Mr. Andrews: The Wealthy has not increased in hardiness since the last year it was put in the second degree list. The apples in the first degree of hardiness are the Hibernal and the Duchess, and I consider those hardier than the Wealthy. The Wealthy was put in second list simply because it is not quite so hardy as the others. The Peerless in some localities does well. In some localities the Peerless has done remarkably well. Where the Peerless has done best in the last three years was on very poor ground. Within the last few years it has done best on a stony knoll where scarcely anything else could be raised. In locations of that kind the Peerless seems to be valuable, but until the last three years it has been worthless.

Mr. Busse: I think I have had the Peerless for the last twenty years, and it has never killed back any, and the Peerless has given me more profits the last five or six years than almost any other variety except the Wealthy.

Mr. Andrews: The test does not lie in the quality of the fruit, it lies in the fact of its being tender or hardy.

Mr. Busse: It seems to me if we regard it in that light we are liable to give some people the impression that they should not plant it. So far as I am myself concerned I think it is one of the most valuable things that I have got.

Mr. Andrews: Perhaps we have given people that impression, I admit, but what is the use of recommending an apple tree for the quality of its fruit when the tree itself is worthless?

Capt. A. H. Reed: Two years ago, if I remember correctly, this society voted the Peerless as unworthy of propagation. That is one of the foolish things this society did. I am prepared to say that the Peerless is one of the best apples we have, and it should be universally recommended for propagation, that is, I mean, within its proper territory. It is a tree that is perfectly hardy with me. It is a better apple than any other apple produced in this state except the Wealthy for eating. It is a slow bearer, I admit, but when it does bear it makes up for anything that it has lacked in the past.

Mr. Sahler: I trust I shall not engender any hard feelings upon the part of any Peerless grower, but what Capt. Reed told us is true, that two years ago the Peerless was voted out of existence by this society, and so far as I am personally concerned I would like to see it resurrected again. I would like to see it restored to its original place, but even a little bit stronger. Last year I had a fair crop of Peerless,

Digitized by Google

and this year I had a heavy crop. However, there is this fact to be taken into consideration, that it needs heavier pruning than any other apple tree that I know of. It produces the best cider of any of the forty-two varieties I have in my orchard. It does not make the most cider, producing about one and a half gallons to the bushel, while the Wealthy and other varieties produce two and two and a half gallons to the bushel. The last two years the Peerless apple has been a heavy bearer.

Mr. Frank Brown: We let a Peerless tree stand in a nursery in a row four years, and this year it bore a wonderful crop of apples.

Mr. Busse: The Peerless sells for the same price as the Wealthy, two dollars a bushel, and I do not believe there is any necessity for throwing the Peerless apple out of that list.

Capt. Reed: I move the report of the committee be amended by putting the Peerless in the list of the second degree of hardiness.

Mr. Andrews: If people want to buy the Peerless for simply a growing tree, there is no better growing tree on my place than the Peerless.

Mr. A. J. Philips (Wis.): I don't see why you want to put the Peerless on the list when you have a dozen better varieties. I would object to the Milwaukee going on, although I have grown that for a dozen years, but I would not want to put it in the second list. It is a shy bearer, but a very good apple.

The Secretary: I think it was last year we took considerable pains to get statistics in regard to the attitude which our members held towards varieties of apples for general planting in the state, and there was a very small percentage interested in the growing of the Peerless. I do not think there was more than one out of ten. I have the exact figures at the office, but I have not the record here. However, the opinion was so little in its favor in the experience of the members present that they voted to take the Peerless off the list. There is no question in my mind, judging from my experience and observation, that the Peerless has generally been a very unsatisfactory bearer. The tree is apparently hardy in Minnesota, or southern Minnesota at least, and in some localities it bears splendidly, and in some localities it is a shy bearer, but as a rule it seems to be very much inferior to many other varieties planted in Minnesota. For that reason, undoubtedly, the committee has placed it on the list "Valuable for some locations." It strikes me that that is the proper place for it. If you recommend it or place it in the second degree of hardiness, it will rank with the Wealthy, and I doubt whether the society want it placed on a par with the Wealthy. In making this fruit list they place some trees in the first degree of hardiness, then there is a second degree of hardiness, then a list for commercial purposes and finally a list that is styled "Valuable in some locations." It is proposed to put the Peerless in this last list as being valuable for planting in some locations. The position in which it is placed in the fruit list might lead some to believe that it is an inferior variety. I would not suggest that it be placed in the list of the second degree of hardiness, but I would give it more prominence

Digitized by Google

than it would receive there, and in order to do that I think we can leave the Peerless where the committee has now located it.

Mr. Ludlow: The Peerless has been largely planted in our section of Minnesota, more largely than perhaps any other variety unless it is the Wealthy, and yet it has been unsatisfactory with us, a shy bearer, and unless, as Mr. Sahler says, it is heavily pruned it throws out such long branches that if it has three or four apples on one of those slender limbs it is bound to break down. It makes a very bad crotch, it is not shouldered like many of the other varieties, and for that reason I was one of those who voted to take it off from the list it was on last year because it was a shy bearer and a bad form of tree. I have nothing against the Peerless apple, it is all right, it is a good tree, a hardy tree, but there are a great many other things that are of more value to us.

Mr. Wedge: I heartily approve of the report of the committee, and I disapprove of my friend Reed's amendment. It seems to me that the committee in its report gets at the thing just right. A year ago we dropped it entirely from our fruit list for the reason that was stated very clearly by our secretary, Mr. Latham. Out of one hundred and twenty-one replies, or perhaps more than that, the Wealthy gets one hundred and twenty-one votes in favor of it, the Duchess one hundred, or something like that, and other varieties correspondingly less. Even the Longfield I think got twenty-nine votes, and the Peerless got just three votes as representing the experience of our tree planters in Minnesota two years ago. It seems to me a variety that has been cultivated as long as the Peerless, if it is of any particular value, should have more than three people speaking in favor of it. In my opinion to put it clear back to the first list would be a very grave mistake. The fact that during the last year or two it has been inclined to improve in its behavior is a good thing, and let us give it another chance, but do not let us put it at the top of the list now.

Mr. Larson: It is like lots of men, it has got to have time to bring out its good qualities.

Capt. Reed: I remember very well that that vote was taken after a nice speech by Brother Wedge, and the society decided to throw it into the brush heap, but what we are after is a good eating apple and a hardy tree, and I am not afraid to let everybody know that we have got those qualities in the Peerless.

Mr. Sahler: In marketing my Peerless apples last fall I telephoned to town that I had some nice apples for sale at a dollar a bushel, and I tell you they sold like hot cakes.

The Secretary: The gist of the whole thing is right here. We had a good crop of Peerless this year, and it seems to have turned the heads of some of our good brothers. You have grown the Peerless for thirty years, and it has been condemned for not bearing well. Even the Martha bore a good crop last year, but you would not want to recommend the Martha for general growing. The experience of one year or two years or even three years would not warrant our placing it in the first place. There are some people who have an idea if an

Digitized by Google

apple is not in the first list it does not amount to much, and that the higher up in the list it stands the better it is. That is not the case, and Mr. Brand, the originator of the Peerless apple, when there was some talk of putting it in the second degree of hardiness, objected to it very seriously, and said he would rather have it in the list for trial where it was than in the second degree of hardiness. If you put the Peerless in the second degree of hardiness, as Capt. Reed wants it, it is a slap at its hardiness. No one questions the hardiness of the Peerless tree, but it does not fruit. Here is Mr. Matthews who has been taken good care of them, and during the ten years that his orchard has been planted he has taken most excellent care of them—there is not a better looking orchard in the state of Minnesota. Last year he got about seventy bushels of apples, and that is about the first he got. This year he got two hundred and twenty bushels—last year, I say, he got seventy bushels from ten acres. If that had been planted to Wealthy or almost any other kind on the list he would have had that amount of apples ten years ago. He has been paying wages for taking care of that orchard all the time, and just succeded in getting seventy bushels two years ago and two hundred and twenty bushels this year. Out of eighty-six trees planted and cared for as other varieties have been cared for, Patten's Greening, Hibernal and so forth, which were planted about the same time Mr. Matthews' were, last year was the first time he got fruit enough to pay for going over the trees to gather it.

Capt. Reed: How many trees did you have? One? (Laughter.)

Mr. Matthews: In 1904 my Peerless trees commenced to bear, and they had very nice fruit, but about that time the leaves began to rust, and I thought they were all going to die, and no one seemed to know what the matter was. I asked Mr. Brand about it, and he advised me one thing and another, but it did not seem to do any good, and two years ago I came up here to know if any one here could tell me. I looked around and saw the man who said he could tell me what the matter was, and if I would do what he told me I would get some fruit. I sprayed a year ago last spring and got some very nice fruit, and this year I sprayed again and trimmed the limbs, and I had a very fine crop of fruit which I sold for one dollar a bushel.

Mr. Andrews: The Peerless as it is recommended to be placed by the committee here stands a great deal better chance than it would if placed in the list of second degree of hardiness. This year it has been very promising in certain locations, but we cannot tell what it will do another year.

The amendment offered by Capt. Reed providing that the Peerless apple be placed in the first degree of hardiness was then voted upon and was declared lost.

The original motion offered by Mr. Andrews for the adoption of the fruit list as reported was then put to a vote and prevailed.

Digitized by Google

Spraying Materials and Foliage Injury.

H. M. ASHBY, SUPT. INSECTICIDE DEPT., SHERWIN & WILLIAMS, CHICAGO.

Arsenate of lead is a chemical compound of arsenic acid and lead oxide, or hydrate. When arsenic oxide is neutralized with lead, reaction can take place in such a way as to give two well defined chemical compounds. If the combination is complete, a neutral salt is the result, and in this the arsenic acid is entirely neutralized by lead. This compound when dried out has a composition of approximately 75% lead oxide and 25% arsenic oxide. This is generally referred to as neutral, or tri-plumbic, arsenate of lead.

The other important compound is made by only partially neutralizing the arsenic acid with lead and giving a compound in which the arsenic only carries two-thirds of the full amount of lead. On a dry basis the combination is 35% arsenic oxide and 65% lead oxide. This is generally known as acid, or di-plumbic, lead arsenate.

Most of the leads on the market are either one of these forms or mixtures of both. The difference between the two compounds in their pure state is about as follows: The neutral lead arsenate is somewhat fluffier and in the paste is apt to contain more water. When pressed to a paste containing 50% water the composition will be 12½% arsenic oxide and 35 to 37% lead oxide.

The distinguishing physical characteristics of this compound are its great fluffiness, the fact that it dries from a paste with a rather gelatinous or horny texture, consequently having very great adhesiveness. Chemically it is quite inert, being practically insoluble in dilute alkali waters, in lime-sulphur solution and the other chemicals with which such compounds come in contact in ordinary spraying.

On account of its chemical stability it has the great advantage of being quite safe in mixing with lime-sulphur solution, hard water, alkaline water, etc., without danger of causing russetting or foliage injury. It is claimed by some authorities that on account of its insolubility it is slower acting in the stomach of the insect, giving a little longer chance for the insect to puncture fruit before being killed, but practical experience has never shown this to be the case, and the neutral arsenate of lead has found the greatest favor among orchardists who make it their business to raise the finest apples for box packing. The settling qualities of this compound rank higher than any other form of lead arsenate, as it stays in suspension longer and settles into a softer paste.

The acid arsenate of lead has a denser and heavier structure, is apt to show water on the top of a package even when the water con-

Digitized by Google

tents are only 40%, and it has not nearly so great adhesiveness as the neutral arsenate of lead. It is also very materially affected by lime-sulphur solution and other solutions, so that free arsenic is liberated and russeting and foliage injury result from its use in many cases, especially in climates where there is much dew or fog, or rain followed by fierce sunlight.

The acid arsenate of lead, however, contains more arsenic and is cheaper to make—arsenic oxide being cheaper than lead oxide—but on account of its poor adhesiveness, granular structure and consequent lack of covering power, and the danger in its use, it has not found as much favor with careful orchardists as the neutral product. On a 50% water basis, this product should contain 15 to 17% arsenic oxide and 30 to 32% lead oxide.

In the early days of spraying with arsenate of lead, when the mixture was prepared direct from sugar of lead and arsenate of soda, the neutral product was always obtained, and the earliest results were based on this compound. Later, as the product began to be turned out as a commercial article, manufacturers found it cheaper to make the acid material, and this was put on the market very largely, and many of the strange results obtained with arsenate of lead in combination with other salts, and when used with hard water and in severe climatic conditions, we now know to have been caused by the use of the acid arsenate of lead.

It seems, therefore, that these two products should be clearly recognized and distinctions made between them. We manufacture both products and indicate each one for its proper use. We very strongly recommend that all fruit tree spraying be done with the neutral arsenate of lead but that for shade tree work and for potato work and such cases, where foliage injury is of least consequence and there is no fruit to be russeted, we believe the use of acid arsenate of lead is permissible, although we have proved to our own satisfaction that the neutral lead is more economical and equally efficient.

The claim is sometimes advanced that the material containing the higher arsenic should naturally be the most effective, but experience has proved beyond question that the arsenical contents of neutral arsenate of lead are more than high enough and that its physical properties place it in the way of the insect to so much greater extent that it is even more powerful than the material containing the higher arsenic, and if the arsenical contents were the main consideration paris green would be far and away better than either form of arsenate of lead.

Digitized by Google

Mr. Kellogg: Why is not arsenate of lead good for potatoes as well as paris green?

Mr. Ashby: It is good for potatoes, it is all right for a mild attack, but when the bettles come thick and fast arsenate of lead does not kill fast enough. When potato bettles come into your field you want to kill them as quickly as possible, and paris green will kill them more quickly than anything else, and that is why it is preferable to arsenate of lead. We have been recommending a mixture of arsenate of lead and paris green for a late spray or an early spray.

Mr. Yanish: Will arsenate of lead burn the plant?

Mr. Ashby: Neutral arsenate cannot burn the plant.

Mr. W. S. Richardson: Do you handle dry lime-sulphur?

Mr. Ashby: We have made it, but it is not practical; it must come in absolutely air tight packages, and the cost of such a package is greater than the cost prepared in water.

Mr. Richardson: What is the difference in cost?

Mr. Ashby: It is more expensive because lead costs more than arsenic, but if you make arsenic the only feature, you could get arsenic cheaper than any form of arsenate of lead.

Mr. Kellogg: What do you know about pyroxaline?

Mr. Ashby: That is a preparation of arsenate of lead and bordeaux paste, I believe.

Mr. Ludlow: If lime-sulphur is put on young trees will that kill the buffalo hopper?

Mr. Ashby: I think not. That is a little beyond my depth, but off-hand I would say it would not kill it.

Mr. Ludlow: I have known trees affected with that, and it is killing the trees.

Mr. Ashby: The arsenate of lead might do that, but the lime-sulphur I do not think would.

Mr. Ludlow: Would that be any benefit in the case of rabbits?

Mr. Ashby: If you want to protect against rabbits the only safe way is to make a fit combination, such as paint, or take lime-sulphur and arsenate paste, and put it on as far up as they will reach.

Mr. Ludlow: Would not that kill the bark?

Mr. Ashby: No, sir.

Mr. Ludlow: I heard of a certain case where a party had some paint left in pails and he went to work and painted his trees, and that man killed every tree that he painted. Another man had buffalo hoppers on his trees and he painted the trees with oil and white lead, and he had the same experience. However, he saved some of his trees. He had pure boiled oil and white lead.

Mr. Ashby: The thin paste is more apt to kill trees than the thick paste. The oil in the thin paste soaks in, and in the thick it does not.

Mr. Ludlow: How thick should it be in order to be safe?

Mr. Ashby: Anything that you cannot put on with a paddle is not safe.

Mr. Underwood: What about mice?

Mr. Ashby: The treatment that holds good for rabbits also holds good for mice.

Digitized by Google

Spraying.

EXERCISE LED BY

H. U. BEEBE, JEWELL NURSERY CO., LAKE CITY.

Mr. Beebe: I am not an authority on spraying, I am simply here to conduct this discussion. There are a few things that I learned in the work in the nursery and in caring for orchards that I want to speak of, and I expect you to reciprocate in giving me your knowledge so that we may have a free interchange of ideas here. There are several things that are primarily involved in the fundamental principles of spraying. One is proper spraying, another is to know the enemy sprayed against, a third is to study spraying directions or spraying formulas and follow the directions. It must not be done in a slipshod manner. It is hard work, and must be for a special purpose. The best time to spray against any disease or insect is at the very outset of the trouble, doing it thoroughly and doing it at the right time. The reason that spraying is often not successful is that a number of things are neglected that should be done. For instance, the spraying material is not properly strained; the pump is not in good working order; the pressure is too low; too much haste in applying the spray; some parts of trees are sprayed and other parts neglected; the spraying material not properly agitated; directions for mixing not followed; nozzle not the right kind for spraying; spraying too early or too late—and a great many things of that kind that are not watched. We often find men getting along with one nozzle clogged instead of keeping two or three in operation. I tried using three nozzles and found that the spray could not be properly distributed. Two nozzles to the pole is best.

Now, in spraying we use one fungicide and one insecticide. The most popular insecticide is the arsenate of lead made by associating acetate of lead with arsenate of soda. Some years ago the matter was agitated as to the possible economy of buying the material and making it. We went to the expense of making it one year and found that it cost fourteen cents a pound, plus labor. We know it can be had for ten and a half cents a pound in two hundred and fifty pound kegs. Arsenate of lead sticks on the foliage, and mixed with the fungicide it stays in solution the best. Paris green is stronger because it gives quicker action, and it is quick action that we want when we use an insecticide on beetles. We found it necessary to use paris green for the beetle that works on the poplars and other trees with quick growing foliage, because it acts quicker than lead. As a fungicide the lime-sulphur seems to be most popular. We also went to the trouble of making that and found it very much more expensive, especially in making it in small amounts, and a great deal of work. Last winter we bought ten barrels of fifty gallons each, the cost of which was fourteen cents a gallon. By making it ourselves I figured out that two hundred gallons of the lime-sulphur spray cost us one dollar and ninety-two cents, sulphate of copper or blue vitriol cost us two dollars for two hundred gallons. Before applying fungicide I consider scraping the bark of the trees one of the most essential features. The

Digitized by Google

rough bark harbors a great many insects, and in scraping the bark clean you destroy their harboring places, and when the spray is applied it becomes more effective. Also it takes a great deal less spray to spray a tree that is scraped than one with a great deal of rough bark on it. It is very essential that trees be thoroughly wet.

Then the matter of trimming previous to spraying is very important, it seems to me. There is a great difference of opinion as to when to trim. I was brought up in New Jersey where we do our trimming in February and March, and it is hard for me to get away from that time. I spoke to Mr. Kirkpatrick about it, and he agreed that as long as you follow the cutting immediately with a covering of one or two coats there would be no damage from February and March trimming.

Jewell Nursery Co.'s bluff orchard. Showing 50 gallon barrel with hand pump.

The hydrometer is quite an important little instrument for testing the lime-sulphur solution. It will be a great help to you, and you will know just what your solution is. When you buy your concentrate you want to know whether it tests 33 Baume. After you have made your solution you want to know whether it is strong enough, and you will not know until you have tested that matter yourself. I test my solution for spraying until I find it is 3.5 Baume; I was using 18 gallons concentrate to two hundred, and I reduced it to sixteen, and found no difference in the condition of the trees from using the weaker spray. I don't know but what we could get at this matter better by having you ask questions than by my telling you what I have told you. Now here is a question handed in to me: "Will spraying plum trees kill the honey bee?" I have not tested that, and I would like to know whether any one is here who has.

Mr. Sampson: It depends on what you spray with.

Digitized by Google

Mr. Greenwood: I would not use arsenate of lead for lice, but I would use kerosene emulsion.

Mr. Beebe: I don't think you will be further bothered if you use lime-sulphur; that will soon dispose of the lice. It does with us.

Mr. Husser: How strong would you make the lime-sulphur for aphis on the apple twigs? It is understood it will kill lice on apple twigs if made strong. Would you put it on for that?

Mr. Beebe: Summer spray is 1 to 41½; that is, for summer spraying of apples.

Mr. Husser: Would that be effective for aphis?

Mr. Beebe: I have not tried it. I would like to know whether any one here has tried it. I am talking now about the effect of lime-sulphur on aphis as a summer spray.

Mr. Bartlett: What is the best kind of a spraying machine to use on a side hill?

Mr. Beebe: My answer would be a fifty gallon barrel with a spray pump, and get one with that big paddle arrangement so that it will agitate the solution.

Mr. Bean: Who is the maker of that?

Mr. Beebe: I use the Morell & Morley.

Mr. Husser: I use the Stahl, made at Quincy, Illinois, and its costs fifteen dollars.

Mr. Beebe: I use a three and one-half inch cylinder; it cost me $22.50.

Mr. John Harrison: You say you use lime sulphur. How do you determine the test?

Mr. Beebe: The Baume is the test to use on the lime-sulphur solution that you buy. If you buy any that tests under 33 per cent Baume you want to use it stronger. This scale is made up from a 33 per cent solution.

Mr. John Harrison: Last year I used 1-40, and I found it very effective. I found but one wormy apple in my whole orchard.

Mr. Beebe: That was the percentage?

Mr. John Harrison: Yes, I used 5 gallons of 33 Baume test, 5 gallons to 200 gallons.

Mr. Fairchild: Can you use lime-sulphur on a cherry tree?

Mr. Beebe: You can use arsenate of lead.

Mr. Fairchild: I suppose a cherry tree can be treated the same as a plum.

Mr. Carl G. Steller: I use 33 Baume test, 1 to 35.

Mr. Beebe: That is not far apart. This gentleman uses five gallons to 200, and I use 6 gallons to 200.

Mr. C. F. Gardner (Iowa): Do you use that for cherry slug?

Mr. Beebe: I have not used it for cherry slug. Has any one here used it for cherry slug?

Mr. Bates: I treated cherry slug three or four years. I used arsenate of lead. If you will use arsenate of lead you will find that will kill them.

Mr. Brady: What strength?

Digitized by Google

Mr. Bates: Three gallons to a barrel, or 3 pounds to 40 gallons of water.

Mr. Gardner (Iowa): Down with us we have to spray the cherry trees, or the slugs would soon eat up the foliage. I use the same combination the gentleman spoke of. I found one good thorough spraying just about the time the slugs begin to show themselves very effective; it killed the whole outfit, and we had no more trouble.

Mr. John Harrison: In spraying my orchard the second time I used the same spray that I used on my currants, and it worked fine. I found it as effective as anything I have ever used; that was sulphur with arsenate of lead.

Mr. Bailey: What is the best time to spray an apple tree? Before or after the blooming period?

Mr. Beebe: I would answer that question by saying after the blooming period, if you only spray once. That is the important time. The best time to spray, and the important time to spray, is just after the petals have fallen and the calyx is still wide open.

Mr. Gardner: But you spray before?

Mr. Beebe: Yes, sir.

Mr. Powers: It should be sprayed before.

Mr. Beebe: Oh, yes, certainly, but I was speaking of the fact if you only sprayed once the important time to spray is after the blooming period, as I have just mentioned.

Mr. John Harrison: I think the first spraying is the most essential. I think the most important time to spray is when the trees are in the dormant stage, just before they come out into leaf at all. I had ten trees affected with something like a scale, or some kind of a scale,—I have not yet learned what it is, but it affected the trunk of the tree and the trees were apparently dead, and with this dormant spray that I used on them they came out almost perfect, and they recovered to such a degree that they revived almost beyond any danger.

Mr. Powers: How would you use that dormant spray? In what proportion would you use it?

Mr. Harrison: Five gallons of lime-sulphur to fifty gallons of water, no arsenate of lead.

Mr. Beebe: In spraying in the dormant stage the arsenate of lead is of no value, the arsenate of lead is an insecticide, while the lime-sulphur is a fungicide. The reason why we do not need to use arsenate of lead is because we do not expect to feed anything in the dormant state. Insects in a hibernating stage do not need to be fed because they do not take anything into the stomach.

Mr. Hazzard: Some one spoke about scraping the trees. I would like to ask what tool is used for scraping the tree.

Mr. Beebe: I used the three cornered meat scraper, such as the butcher uses to scrape his block. I find that is about as good a tool to use as anything I have ever tried.

Mr. Hazzard: Is there not danger of going too deep?

Mr. Beebe: Yes, a man has got to be a little careful and not have it too sharp, and ought to be careful as to how he uses it on the tree.

Digitized by Google

Mr. Kirkpatrick: I use an ordinary garden trowel. I find it makes a fine tool for that purpose. One reason why I like it is because it has two edges with which you can scrape the trunk of the tree.

Mr. Husser: Why not use a good steel tool?

Mr. Greenwood: I think a curry comb is about as good as any tool you can use for that purpose.

Mr. Carl G. Steller: A garden hoe is as good as anything that I have ever used.

Mr. Beebe: Would not the handle be in the way?

Mr. Steller: Yes, if it is left full length, but then the handle can be cut off to any length so it will not be in the way.

Mr. Bradley: Is arsenate of soda a satisfactory spray when used as an insecticide?

Mr. Beebe: I think somebody spoke about that yesterday. Arsenate of soda is made up of one part of white arsenic and four parts of sal-soda, with one gallon of water boiled twenty-six minutes. That makes arsenate of soda. He says put one quart to fifty gallons of water and three pounds of lime, and that will neutralize it so that it will not burn—by adding the lime that makes arsenite of lime. I may state again that if you put in three pounds of lime and one quart of arsenate of soda and fifty gallons of water, it forms arsenite of lime, and that will not burn.

Mr. Kirkpatrick: As to the question whether arsenite of lime is practical for spraying purposes in summer, I might say that in 1907 I worked in an orchard of eighty acres where we used nothing else, and we had excellent results. We used that in preference to arsenate of lead. It has got to be made with extreme care and used with the greatest of care, but if those precautions are followed there will be no trouble, and the success will be very marked.

Mr. Steller: Do you think that will stick as well as arsenate of lead?

Mr. Beebe: The lime may help that to stick to some extent, but it will not stick as well.

Mr. Powers: I would like to ask whether you mix paris green with arsenate of lead or whether you use it alone?

Mr. A. H. Barnhard: Paris green and arsenate of lead are both insecticides; they do the same work, and we do not use them together.

Mr. Powers: I noticed down stairs in the exhibit room where they are giving a demonstration of spraying they have paris green and they also demonstrate arsenate of lead, and I was wondering whether the two were used together.

Mr. Beebe: I think I stated that paris green is the stronger and works quicker.

Mr. Powers: Do you use paris green with lime-sulphur?

Mr. Beebe: Yes, you can use it with lime-sulphur, with sulphate of copper or blue vitriol.

Mr. Dann: Can plum pocket be controlled by spraying?

Mr. Beebe: I don't know, but I do know that our plum orchard two years ago was overridden with plum pocket, and I bothered the experiment station a good deal about it, and I went right to work with

Digitized by Google

a scraper and a pruning shears and a lime-sulphur spray—that was a year ago, and at this present time, or this present year, there were no plum pockets in our orchard whatever.

Mr. Husser: I would like to hear from anyone else who has had a similar experience with plum pocket.

Mr. Gardner: When you went in there with your pruning shears and cut off those limbs or twigs that had plum pocket did you burn them?

Mr. Beebe: Yes, all the wood and plum pockets that were cut off were burned.

Mr. John Harrison: I would like to ask whether any one has tried spraying with dry lime-sulphur.

Mr. Beebe: You mean by dust spraying, I suppose?

Jewell Nursery Co.'s bluff orchard. Showing 200 gallon tank fitted with hand pump, 3½ inch cylinder.

Mr. Harrison: Yes, sir.

Judge Moyer: I tried it this year and had good success—because I had an abundance of good plums—but my neighbors had the same experience, and so I don't know whether it was any good or not. (Laughter)

Mr. Greene: Do you boil your lime-sulphur, or do you allow it to boil itself?

Mr. Beebe: We boil it in a kettle.

Mr. Greene: Why not let it boil itself?

Mr. Beebe: That may be all right and may be all that is necessary, but I thought it helped it out by boiling.

Mr. Baker: I shouldn't think it would make much difference whether it is self-boiled or whether it is boiled by artificial heat.

Mr. Beebe: If you use it boiling hot it will slake more rapidly, and you can use it quicker.

Mr. Harris: I would like to know how many use power sprayers.

Digitized by Google

Mr. Beebe: We tried an automatic sprayer, and we found it was not successful. We did not have long enough to run to keep up the power, and the pump was not the right kind. It didn't work well, so I went right back to the hand pump. I have not used a power sprayer. However, I would like to know whether any one here has used it.

Mr. Gordon: I have used the American Sprayer Co. sprayer with horses, and when I found that the power was running down a little I would take a turn around a couple of apple trees and spray two rows at a time. In that way I got my power back again, and it worked very satisfactorily.

Mr. Steller: I use a power sprayer and have used one for the last three or four years, and I would not want to go back to the hand pump sprayer. I have no trouble in keeping up power whatever.

Mr. Beebe: This automatic sprayer was very highly recommended.

Mr. Cashman: We have used a gasoline power sprayer for the last three or four years, and we like it very much. It takes two rows of trees at a time. The tank holds two hundred and fifty gallons of liquid, and we can cover a good deal of ground.

Mr. Steller: I use two horses on my sprayer, and I think I have as many side hills as any one, but if the ground is level and so the horses can walk on it, you can let your team walk right along and spray three thousand trees a day.

Mr. Beebe: Does not the wind bother you?

Mr. Steller: No, not much. If you put your pressure on high enough it will not bother you much, and then if you go with the wind it will not make much difference anyway.

Mr. Beebe: I was questioning whether you gain very much by using a power sprayer over a hand pump.

Mr. Steller: I think we do very much.

Mr. Beebe: I have the teamster work the handle of the pump.

Mr. Philips: Then you don't do it yourself? (Laughter)

Mr. Beebe: No, sir, but I change off with the teamster; I let him hold the nozzle for a while and I do the pumping, and then I let him do the pumping and I hold the nozzle, and in that way we change off.

Mr. John Harrison: What amount of pressure can you get from a hand sprayer?

Mr. Beebe: I have not tested that, but I get as good and strong a spray from the nozzle as I did from the automatic sprayer.

Mr. Harrison: I have a machine with two hundred pounds pressure, and I think I can cover the ground about as rapidly as I could ordinarily do it with two hand machines.

MICE prefer to work where there is dead grass, weeds or debris of some nature in which to harbor, and a fall of snow makes this shelter more secure. In order to minimize the danger, the grass and weeds should be removed from about the trees for a distance of one or two feet.

Digitized by Google

SUMMER MEETING, 1912

Minnesota State Horticultural Society

A Joint Session with the

MINNESOTA STATE GARDEN FLOWER ASSOCIATION

(Formerly Minnesota State Rose Society)

WILL BE HELD

FRIDAY, JUNE 14, 1912

The regular summer meeting of the society will convene us usual at the State Experiment Station, St. Anthony Park (in Armory Hall), and the date for this meeting is set as near as can be arrived, at a considerable time before hand, to come when the strawberry season is at its height in this vicinity. The season being favorable a large exhibit of seedling strawberries may be expected from the State Fruit Breeding Farm, Chas. Haralson, Superintendent.

PREMIUMS.

The principal feature of the meeting, as will be noted by the following premium list, is the exhibit of roses, peonies, garden flowers and a single fruit, strawberries. Some changes have been made from the list of last year, to which your attention is called, and the amount of premiums is slightly increased. The season has so far been favorable for flowers, and we have reason to expect a splendid showing that will occupy every foot of available space in Armory Hall. Exhibitors are urged to come early, so that everything may be in place without unnecessary confusion and haste at the time set for the opening of the exhibition, 11:30 a. m.

VISIT THE FRUIT-BREEDING FARM.

Arrangements will be made at this meeting with as many as desire to do so to visit the State Fruit-Breeding Farm, at Zumbra Heights. This is a very interesting spot to Minnesota horticulturists and will well repay the small expense connected with the visit. Zumbra Heights is a station some five miles west of Excelsior on the St. Louis road. Returning visitors will probably be taken by carriage from the farm to Zumbra Heights landing place on Lake Minnetonka, where the steamers stop every hour to receive passengers connecting with the trolley line to Minneapolis.

DEMONSTRATIONS IN SPRAYING AND PRUNING.

It is probable that there will be demonstrations in spraying with a number of different kinds of spraying apparatus, either by the dealers in the apparatus or by some of those connected with the Experiment Station. Demonstrations in pruning may also be expected in the station orchards. These demonstrations will occur during the forenoon and not interfere with the other announced exercises of the meeting.

Digitized by Google

DINNER.

There will be an old fashioned picnic dinner, each group of persons arranging for themselves a picnic upon the grounds at some chosen spot, or in case of inclement weather in some of the buildings which will be opened for that purpose. The management will provide coffee (with cream and sugar) gratuitously, but members attending will be expected to furnish cups in which to receive it. No tables will be provided for this purpose, the grounds being so spacious and well shaded that convenient nooks for picnicking can be found in sufficient number to accommodate all. The experience of last year proves that this arrangement is an entirely pleasant one. For those who come unprovided there is a restaurant adjoining the grounds where a limited number can be cared for.

AFTERNOON MEETING.

The afternoon session of the society will begin at 2:00 o'clock and continue for one and one-half hours. It will be in large measure, as heretofore, an impromptu program, and exhibitors will be given an opportunity to talk about the fruits and flowers shown, and the audience may ask questions to draw out any interesting points, either orally when the speaker is on the floor, or by written questions to be placed in the question box, as may suit the convenience of each. We are expecting to have with us from abroad C. S. Harrison, of York, Neb., whose health is very much improved--also Oliver Gibbs, now for a number of years a resident of Florida.

HOW TO REACH THE GROUNDS.

Take the Como-Harriet or Como-Hopkins car, either in St. Paul or Minneapolis, and get off at Carter Avenue, where carriages will be found waiting to carry visitors to the grounds, one-half mile distant, from 9:30 a. m. to 1:30 p. m.

ENTRIES.

All entries must be in the hands of the secretary not later than Tuesday, June 11th. *No entries can be received at the meeting.*

The size to which the exhibition made at the summer meeting has grown makes it impracticable for entries to be received on the day of the meeting, the necessary clerical work connected with these entries requiring considerably more time than is then to be had. Exhibitors are urged to *send lists of their entries* to the secretary *at as early a date as possible,* under no circumstances to be received later than the date noted above. *Entry blanks* for this purpose *will be furnished* by the secretary *upon application.*

PREMIUM LIST.

All exhibits *must be in place and properly labeled by 11:30 a. m.* to be entitled to compete for premiums.

Exhibitors competing must be members of this society and growers of the articles exhibited. (Members of any auxiliary society by virtue of such membership are also members of the Horticultural Society without additional expense.)

Fruits and flowers shown become the property of the association.

Rose and peony blooms can be kept in cold storage if necessary.

N. B.—See *Secretary's Corner* for notice of dedication of memorial tablet to Peter M. Gideon, which will occur Saturday, June 15th.

Digitized by Google

Premium List, Summer Meeting, 1912.

OUT-DOOR ROSES.

	1st prem.	2nd prem.	3rd prem.	4th prem.
Collection—three blooms of each named variety, to be shown in separate vases	$10 00	$6.00	$3.00	$1.00
Collection of named varieties—three blooms of each, in separate vases, amateurs only	10.00	6.00	3.00	1.00
(The prizes as above, amounting to $20, are contributed by Mrs. Jessica De Wolf, St. Paul, and Mrs. J. M. Underwood, Lake City.)				
Three named varieties, white—three to five blooms of each, in separate vases	2.00	1.00	.50	
Three named varieties, pink—three to five blooms of each, in separate vases	2.00	1.00	.50	
Three named varieties, red—three to five blooms of each, in separate vases	2.00	1.00	.50	
Collection of Rugosa and Rugosa hybrids, three to five blooms each, in separate vases	3.00	2.00	1.50	1.00
Most beautiful rose in vase—Bronze Medal, donated by American Rose Society.				
Largest rose—in vase	1.00			
Seedling rose (to be shown by originator)	3.00	2.00	1.00	

The following named varieties of roses to be entered separately and shown in separate vases, three to five blooms in each vase.

Prince Camile de Rohan, General Jacqueminot, Margaret Dickson, M. P. Wilder, Jules Margottin, Magna Charta, Paul Neyron, Madam Gabriel Luizet, Baroness Rothschild, Anna de Diesbach, Ulrich Brunner, John Hopper, Rosa Rugosa (pink and white), Baron de Bo stetten, Karl Druski, Madam Plantier.

Each, 1st prem., 75 cents; 2nd prem., 50 cents; 3rd prem., 25 cents.

PEONIES

	1st prem.	2nd prem.	3rd prem.	
Vase of Festiva Maxima, 6 blooms	$2.00	$1.00	$ .50	
" " light pink "	"	"	"	
" " dark " "	"	"	"	
" " white "	"	"	"	
" " red "	"	"	"	
Collection—three blooms of each variety in separate vases	1st prem. $8.00	2nd prem. $6.00	3rd pram. $4.00	4th prem. $2.00
Collection—three blooms of each variety in separate vases, amateurs only	6.00	3.00	2.00	1.00
Seeding peony, three blooms	3.00	2.00	1.00	.50

ANNUALS AND PERENNIALS.

	1st prem.	2nd prem.	3rd prem.	4thprem.
Vase of Iris.....each	$2.00	$1.00	$ .50	
" " Delphinium "	"	"	"	
" " Sweet William "	"	"	"	
" " Lilies "	"	"	"	
" " Sweet peas "	"	"	"	
" " Canterbury bells "	"	"	"	
" " Foxgloves "	"	"	"	
" " Shasta daisies "	"	"	"	
" " Iceland poppies "	"	"	"	
" " For-get-me-nots "	"	"	"	
" " Perennial coreopsis "	"	"	"	
" " Pansies "	"	"	"	
" " Gaillardias "	"	"	"	
Collection—named Perennials, in separate vases	$7.00	$5.00	$2.00	$1.00
Collection—named Annuals, in separate vases	7.00	5.00	2.00	1.00

STRAWBERRIES.

One quart of *each variety*, to be shown on plate, *not in box*.

Collection (not less than six varieties):

1st prem., $5.00; 2nd prem., $4.00; 3rd prem., $3.00

Collection of three named varieties..... 3.00; 2.00; 1.00

The following varieties of strawberries to be entered separately:

Bederwood, Dunlap, Crescent, Splendid, Clyde, Warfield, Lovett, Enhance, Glen Mary, Haverland.

Each, 1st prem., $1.00; 2nd, 75 cents; 3rd, 50 cents; 4th, 25 cents.

Best named variety not included in above list:

1st prem., $2.00; 2nd, $1.00; 3rd, 50 cents.

Seedling, originated by exhibitor: 1st prem., $3.00: 2nd, $2.00; 3rd, $1.00.

A. W. LATHAM, Secretary,
207 Kasota Block, Minneapolis.

THOS. E. CASHMAN, President,
Owatonna.

Digitized by Google

THE VEGETABLE GARDEN

Seasonable Notes for June

By H. J. BALDWIN, NORTHFIELD

A promise was made in the notes for May that the subject of insects and remedies would be treated at this time. To be a successful fighter one needs to observe closely the habits of insects in order to be better able to destroy them. I will relate what I mean by citing one example.

The big squash bugs, or stink bugs, were destroying my vine crops at a great rate. I observed that at night they all came into a small roosting place, covering perhaps a square yard. Poisons would not kill them, as they are sucking insects. It was an easy job to kill the ten or twelve colonies I had by burning them with a gasoline torch such as the electricians use for soldering purposes. This is a very handy tool for tent caterpillars and striped squash bugs.

How often we hear of people trying to poison lice with paris green. Bugs that eats the leaves, like potato bugs, can be killed with applied poison. I get along nicely with arsenate of lead for potato bugs, usually applying twice during the season. The greatest trouble has been with many to get it reasonable enough. I have been paying 8½ cents a pound, so can afford to use it pretty strong—there being no danger of its washing off with rains—thereby saving lots of labor. This is a most excellent poison for cabbage worms used at the rate of three pounds to fifty gallons of water and enough soap to make a good suds. As sprayed on the smooth cabbage leaves it will stick readily. Never drench cabbage with a sprinkler pot, but use some form of sprayer. This poison does not injure the foliage.

Remedies are hard to find for the pesky cut-worm. By wrapping tomato and cabbage plants with a little paper a little below the surface and two or three inches above it will keep them from cutting these plants. Some advise using poisoned sweetened bran mash or inverted sods with paris green on the grass. Where small chickens roam freely they usually make way with the cut-worms.

Be sure and plant more sweet corn. The late cabbage crop will be planted after the middle of the month. Succession crops can be planned for to occupy the ground where the early crops have been gathered, as spinach, early peas and green onions. Old berry beds plowed under make a good place for late sweet corn of an early variety. The late celery will need planting out the last of the month.

Marketing the surplus truck will be part of our subject next month. Observe this motto: "If at first you don't succeed, fail, fail again."

(Garden Helps continued from page 239)

Hollyhocks should be sprayed at once with either ammoniacal copper carbonate or bordeaux mixture and this repeated at frequent intervals to prevent the hollyhock disease, which is becoming common in our gardens.

It is the duty of every one with a garden to keep down as far as possible these diseases and pests.

It is earnestly hoped that every member of the Minnesota Garden Flower Society will have an exhibit at the flower show in June.

Digitized by Google

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by MRS. E. W. GOULD, 2644 Humboldt Avenue So., Minneapolis

No sooner are our seeds in the ground than a thousand enemies swarm on all sides to devour them. It is none too soon to begin fighting these pests, and to that end formulae of some of the most common remedies are given below.

POISON FOR CUT-WORMS.—1 quart bran, 1 tablespoonful paris green and enough water to make a thick mash. Scatter near plants as near evening as possible. (Poultry must be kept from a garden so treated.)

Remedies for Fungous Diseases—BORDEAUX MIXTURE. To make one gallon: 1 heaping tablespoonful copper sulphate, 1½ rounding tablespoonfuls of fresh quick lime. Dissolve the copper sulphate in one quart of warm water. Slake the lime with a little water in another vessel. When it stops bubbling add enough water to make a quart. Mix a small quantity of each together in a third vessel, repeating until all has been used. This will make two quarts of a bluish white mixture. Add to this two quarts of water. It should be stirred frequently while being sprayed and be made fresh each time it is used.

AMMONIACAL COPPER CARBONATE.—Two gallons: 2 level teaspoonfuls of copper carbonate, 2 fluid ounces ammonia, 1 quart water. Pour ammonia over the copper carbonate. When dissolved add the water. After settling pour off the clear blue liquid into your spray bucket, adding seven quarts of water. As ammonia varies in strength the amount required to dissolve the copper carbonate may be more or less than the two fluid ounces.

This spray is used instead of bordeaux mixture and leaves no stain on the leaves or fruit. Should always be *fresh*.

Remedies for sucking insects, such as plant lice, or aphis.

KEROSENE EMULUSION.—Cube of hard soap, 1 inch square, ½ pint water, 1 pint kerosene. Melt soap in water by boiling. Remove from stove and beat in kerosene with eggbeater until the whole is a creamy mixture. One part of this to fifteen or twenty parts of water is the strength usually used.

Combined contact insecticide and internal poison.

WHITE HELLEBORE.—1 ounce white hellebore, 3 gallons water. May be used against both chewing and sucking insects.

POTASSIUM SULPHIDE (liver of sulphur) is valuable for mildew on plants: ½ to 1 ounce to 1 gallon of water.

Poisons for chewing insects.

PARIS GREEN.—One heaping teaspoonful paris green, 3 heaping teaspoonfuls lime, 3 gallons water. The same amount of paris green can be added o three gallons of bordeaux mixture, thus making a mixture that will killt both fungous diseases and chewing insects at the same time.

ARSENATE OF LEAD.—The difficulty of using paris green is the fact that it washes off easily. A substitute for that poison that will adhere through showers is arsenate of lead. This chemical comes in the form of a thick paste. For a small quantity use 1 tablespoonful rounded, 1 gallon of water or bordeaux mixture. The latter makes another double header poison. Twice this strength may be used in the case of resistant insects, such as beetles.

(Continued on preceding page.)

Digitized by Google

SECRETARY'S CORNER

IS THERE A CIVIC IMPROVEMENT CLUB IN YOUR VICINITY?—If so, will you please send to Secretary Latham the address of the president or secretary. For a number of years we have had valuable reports from the improvement association at Lake City. We are sure there must be other similar associations in the state, and it certainly would be a mutual advantage for the society to come in touch with them.

OUR SPECIAL TOP-GRAFTING PREMIUM.—The special premium of six trees which was offered to "new members or old members securing new members" was called for by 115 different persons. These trees consisted of three either Hibernal or Virginia trees two years old as stocks to top-work on, and one each of Delicious, King David and Lowland Raspberry. The trees sent out were of a larger size than advertised, and as far as we know have given good satisfaction. We anticipate interesting returns from this experiment.

MINNESOTA FRUIT AT ST. PAUL LAND SHOW.—At the last annual meeting, as a result of action taken there, the society undertook to assist the St. Paul Land Show in making a creditable apple exhibit. Reference has previously been made to this exhibit, which was more of a success than anticipated, as a very large proportion of the fruit furnished could not be put upon exhibition. It is only within a short time that all the figures connected with the expense of the show to the society were available. They are as follows: Paid for fruit to C. G. Steller, $35.00; J. F. Harrison, $12.00; A. B. Lyman, $3.50; Fred Zuercher, $9.00; paper for wrapping apples, $1.08; Thos. Redpath, superintendent of the exhibit, $45.00; F. I. Harrison, assistant superintendent, $45.00; sign (which we couldn't use because the exhibit was too small to accommodate it) $4.50; making a total of $205.08 expended. From this should be deducted $50.00, the amount received for fruit sold at the close of the show, leaving the total amount paid by the society $105.08.

DEDICATION OF GIDEON MEMORIAL TABLET.—Mention has been made previously in the Secretary's Corner of a tablet which was being prepared by an association in Minneapolis, called the "Native Sons of Minnesota," to be placed on the Gideon farm in commemoration of the origination of the Wealthy apple. Arrangements have now been completed for the dedication of this tablet, and it will take place at a point on the Gideon farm a short distance south of Manitou station on the electric line, Manitou being the first stopping place west of Excelsior. There will be appropriate exercises, including an address by some member of the organization furnishing the tablet, and short addresses by a number of members of the State Horticultural Society. These exercises will be held at 2:00 p. m. Saturday, June 15th, the day following the summer meeting of the society. As this is a very convenient point to reach, electric cars stopping at Manitou, leaving Minneapolis at three minutes past the even hour, it is hoped that there will be a large representation of the society present. The original plan has been deviated from somewhat in preparation of this tablet, it being as it now reads a memorial for Mr. Gideon himself as well as for the Wealthy tree. The tablet could not well be erected on the exact site of the original tree, but is being placed at a conspicuous place on the Gideon farm on the main traveled boulevard from Excelsior to Minnetonka Beach. The full program of this event may be given out at the summer meeting.

Digitized by Google

Digitized by Google

OUT-DOOR SESSION, SUMMER MEETING, 1912, STATE HORT. SOCIETY, ADJOINING THE ARMORY—
AS MANY MORE INSIDE ENJOYING THE FLOWER EXHIBIT.

Digitized by Google

☞After reading this magazine, will you please pass it along to some friend who will appreciate it and whom you may perhaps interest to become a member of the society—at least he should derive benefit from its reading. By distributing in this way the twelve magazines received during the year 1911, at the beginning of the next year—upon renewing your membership in the society—you will be entitled to receive postpaid a cloth bound volume containing all the magazines for 1911 and much other interesting matter, with a full index of all its contents, entitled "Trees, Fruits and Flowers of Minnesota," a handsome book for your library and invaluable for reference.

THE MINNESOTA HORTICULTURIST

Vol. 40. **JULY, 1912.** **No.**

SUMMER MEETING, 1912

Minnesota State Horticultural Society

A JOINT SESSION WITH

MINNESOTA GARDEN FLOWER SOCIETY.

A. W. LATHAM, SECRETARY.

Following the issuance of the notice of the regular summer meeting there came a period of ten or twelve days of abnormally cold weather, which kept vegetation back so that when the meeting convened on Friday, June 14—almost the only pleasant day that we had had in two weeks—fruits and flowers were so backward that instead of it being a strawberry exhibit, as we intended, there were only five plates of strawberries on exhibition. Instead of an exhibition of two or three hundred new seedlings of strawberries from the Fruit-Breeding Farm which we were expecting, there were none mature enough to exhibit. Roses were almost as backward, so that while there were two or three dozen vases of roses shown, mainly by Mrs. H. B. Tillotson and the Jewell Nursery Company, the rose exhibit was a very small one. Peonies, however, were in their glory, and the hall was gorgeous with the finest display of this flower that we have ever made. There were plenty of perennial flowers on hand also, so that when the exhibit was all out it was found to be as a whole the largest and finest flower show that the Horticultural Society and Garden Flower Society working together has ever made. Anticipating a light exhibit on account of climatic conditions, results were especially pleasing to us, and as the day was a nice one and altogether pleasant to be out in, the attendance was up to normal.

Digitized by Google

An interesting program of about an hour and a half took place outside, as the day was suitable for such a gathering, and the hall itself was too full of flowers to hold the meeting in. A partial report of the speakers making up this impromptu program follows. At its close flowers were distributed as usual, and all present seemed to be thoroughly satisfied with the success of the occasion.

J. M. Underwood: "I have been asked to take charge of the exercises here this afternoon because the president of our society is compelled to be in the senate at the legislature. I want to introduce to you Mrs. E. M. Newcomb, of Denver, who will give us a poem on flag day.

Mrs. E. M. Newcomb recited an original and appropriate poem.

Mr. Chas. Haralson, Superintendent State Fruit-Breeding Farm: "I am just going to say a few words about the fruit farm. We are having quite a lot of strawberry seedlings this year, but the meeting comes a little too early so that we can't show any fruit, but we have some 900 selected varieties fruiting this year, and then we have about 10,000 plants fruiting for the first time this year, and among them is I think some very good ones. And the same way with the plums. The plum hybrids are setting very full this year again. They were very large plums last year, and I think they will be larger this year. The apples will be a very short crop. Very few among the seedling apples will fruit. The Malinda seedlings have a few specimens, not very many. There is also a lot of 7,000 seedlings that Mr. Elliot had started from seed, and these are growing well, and they are being watched with interest. As a whole the fruit farm is coming along very well, and I think we are going to get some more good varieties. It will take a few more years to try some of them out but they are coming."

Dean A. H. Wood: "As I travel over the state it seems to me I find more men and women that know more about scientific horticulture than in California—and California can't beat you—and when it comes to a study of the development of crops to fit particular conditions even California, leaving out Burbank's little farm up near San Francisco, even California doesn't begin to compare with Minnesota. I was pleased to have one of the government men tell me that our fruit-breeding farm, beyond Excelsior, is the largest institution of its kind in the world. I supposed that there was a larger one at Sweden, but that is a grain-breeding farm. When it comes to fruit-breeding I think it is safe to say that Minnesota has the largest and probably one of the best equipped fruit-breeding farms in the world, and the work that is being outlined there is something that you could hardly realize unless you have been out to see it. Out there it is by the hundreds of thousands. If Mr. Haralson hasn't 250,000 seedlings he doesn't think he has anything worth fooling with. They furnish besides an excellent practical field for selection of new plants and most reliable field for the study of laws affecting plants fruiting, and the government has put in a lot of money, and the state has put in considerable, in putting one of our best trained men there, who is giving his whole time to the study of the laws that underlie this subject."

Digitized by Google

Rev. C. S. Harrison, York, Neb.: "Of course I am glad to be with you. I agree with what your dean has said. I think it is pretty hard to beat old Minnesota. I came here in '57. I know something about your state. I spent last winter in California. They are ahead of you in some things. They raise two large crops there, one is a crop of suckers and one a crop of land agents. I was called on to address our York County society at a sort of picnic, and I got off something like this: 'We have come to the land of eternal summer where real estate agents just grow on the trees, and you can hear their sweet wooings in every breeze.' In order to comprehend this you ought to know that there are 4,000 real estate agents in California alone. I want to tell you one thing: It is called the land of flowers. I was through southern California pretty well, and I never saw anything to compare with the show inside here. They can't raise peonies there. You have got the best society on the face of the earth. Up here in Minnesota you can get up such an exhibition as you have got there. I have been recently paying some attention to a new industry and that is raising the iris. I never saw anything in California or anywhere else that can compare with our iris garden. I have 180 varieties. Send me your address, and I will send you my book on iris and welcome."

East half of Armory, giving partial view of flower exhibit.

Mr. Rowley: "I see that it is the habit for the speaker to explain the state where he is from. At the present showing I am a citizen of this beautiful city and this state, and while I am on that subject I might as well mention that I think this is 'some state.' I was previously in the state of Washington. In the city of Everett, a city of 40,000 inhabitants, there is an Anoka club with 151 members and in Seattle is a Minnesota club that has something like 1,500 members, and the

Digitized by Google

president of the club is Mr. H. S. Walker, of Stewartville. He is very active in getting together the people of Minnesota. I want to call your attention to the fact that they raise strawberries out there, millions of crates of them. The best they have though don't equal what they have here, and we haven't a market for them there. Finally some wise individual suggested that they organize a fruit association, which they did with 135 members. One hundred and thirty-four of this number wanted to be president, and the other one wanted to be manager. During its existence they raised 50,000 crates. They sold 45,000 crates of berries for about thirty-five cents more than they ever got for berries. They organized a producers' union. It went into effect, and it ran along for a year or two, and both of them died. Then the next man that advocated a producers' union or association, he kept it up. He was a gentleman from this locality. He finally got an organization started that had in its beginning 435 members. At that time they were producing 60,000 crates of berries, selling half of them and throwing the other half away. They raised the first year a little over 70,000 crates and sold them for about eleven or twelve cents more than they ever got before."

K. A. Kirkpatrick: "I am glad that our chairman allowed Mr. Rowley plenty of time, especially as we are endeavoring so greatly to establish an association in this state this year. I hope that if there are any people here who are in any way connected with fruit growing that you will get behind this matter of fruit association and give it a chug. The reason why I want you to do it is that if it were a big year and we had a bumper crop, we would have more than we could handle. Then when that kind of a year comes we can do you some good."

Mrs. J. A. P. Neal, secretary of the Rose Society of Duluth: "The Rose Society was organized on March 25th, 1910, by Mrs. F. H. Gibbs, of Minneapolis. One of the things the society has done was the dissemination of hardy rose bushes. Last year the Rose Society of Duluth distributed 236 rose bushes of the hardy varieties, the varieties chosen being especially adapted to this climate, Frau Carl Druski and Ulrich Brunner. The number of rose bushes distributed by the society this year is over 2,000. This was done by going through the schools. Some of the choice varieties are Persian Yellow and Mrs. John Lang. The society has distributed through the schools a large number of flowers. There is a growing interest in all varieties of flowers and varieties of shrubs. The society is doing its utmost to encourage every citizen of Duluth in making the soil attractive to the eye."

Mr. Underwood here invited the Rose Society to hold their next meeting at Lake City and that it to be the next Thursday. Mrs. H. B. Tillotson talked of the invitation to Lake City. The Rose Society is for the benefit of the amateurs and also as they have grown they have taken in the professionals.

Prof. E. M. Freeman: "I invited a lady the other day to come out to the meeting of the Horticultural Society, and I told her about all the beautiful peonies. She said, 'Are there any speeches,' and of course I told the truth and said 'yes.' She replied, 'Not for me.' I

Digitized by Google

don't want to talk about diseases. My special line is to tell of these pessimistic things. They used to say when I came here about four years ago that they never had any of these things. Since these diseases are coming in from all over the state I will have to be given credit for having brought them. These things, however, exist. I could only say this one thing: I wish you would keep in touch with us and send things in. We can send you a little card, and you can fasten it onto the bundle and send it in, and in that way you don't even have to pay postage. The government has co-operated with us. We want to learn about the diseases. You want to remember this: as you grow crops right along on certain soils you are bound to get diseases. Plants have health and they have diseases, just as human beings and animals have. You are going to get them, and the longer you grow crops the more there will be of them perhaps. You must learn what these diseases are and how to prevent them."

Oliver Gibbs: "They give me five minutes to talk, and I want about that much time to get my voice up into condition so I can be heard. Prof. Freeman tells us of a lady he invited to come to this meeting. It's a pity that he didn't bring the lady along as one speaker on account of the lateness of the hour begged off and didn't make any speech at all."

Chas. Nordine: "If you want to be successful with roses you must give them a great deal of care and a great deal of attention. It won't do to plant out your roses and then go away and leave them. If we want good roses you must give them good attention in cultivation and spraying for the different diseases and watering if the season is dry, and when you water, water thoroughly and then leave them until they need it again. Good cultivation is one of the most important things. Always keep the ground loose on top; this will encourage growth and let sunshine and air into the ground."

Question: What to use as a spray for rose slug? White hellebore will fix them. For white spot use copper carbonate solution.

Sandy soil will produce very good roses provided it is good and rich.

If the soil is sandy where you want your roses, get some clay and work in with it.

Remedy for black spot? Spray while foliage is at its best once in two weeks, and when black spot appears, once every week. Keep the black spot leaves picked off and destroyed.

Mr. Brackett: Peter Gideon originated the Wealthy apple, an apple that has been of more value to Minnesota than any other, and has stood the winter better than even the Patten's Greening. We thought all the time the Patten's Greening was a hardy apple. I have found that this hard winter has given us a great many lessons. We have found that the Northwestern Greening is not worthy to be planted in Minnesota, and we should go through our orchards and thin them out.

Digitized by Google

Award of Premiums, Summer Meeting, 1912.

ROSES.

Collection, professional	Jewell Nursery Co., Lake City	First		$10.00
Collection, amateur	Mrs. H. B. Tillotson, Eureka	First		10.00
Collection, amateur	Thos. Redpath, Wayzata	Second		6.00
Three varieties, white	Mrs. H. B. Tillotson, Eureka	First		2.00
Three varieties, pink	" "	First		2.00
Three varieties, red	" "	First		2.00
Collection, Rugosa and Rugosa Hybrids	B. T. Hoyt, St. Paul	First		3.00
Seedling rose	" "	First		3.00
Seedling rose	Prof. N. E. Hansen, Brookings, S. D.	Second		2.00
Largest rose	Mrs. H. B. Tillotson, Eureka	First		1.00
Most beautiful rose	" "	First, bronze medal		

EMMA V. WHITE,
A. BRACKETT, Judges.

PEONIES.

Collection, professional	B. T. Hoyt, St. Paul	First	8.00
Collection, professional	Jewell Nursery Co., Lake City	Second	6.00
Collection, professional	E. A. Farmer, Minneapolis	Third	4.00
Collection, amateur	Mrs. H. B. Tillotson, Eureka	Second	3.00
Collection, amateur	F. W. Bell, Minneapolis	Third	2.00
Collection, amateur	Mrs. S. R. Spates, Wayzata	Fourth	1.00
Collection, amateur	Mrs. J. E. Stryker, St. Paul	First	6.00

GUST MALMQUIST,
GEO. REID, Judges.

VASES.

Festiva Maxima	B. T. Hoyt, St. Paul	Second		1.00
Light Pink	" "	First		2.00
Dark Pink	" "	First		2.00
White	" "	First		2.00
Light Pink	Mrs. Frank Moris, Lake Elmo	Second		1.00
Dark Pink	" "	Second		1.00
Festiva Maxima	Mrs. J. E. Stryker, St. Paul	First		2.00
White	" "	Second		1.00
Red	" "	Second		1.00
White	Jewell Nursery Co., Lake City	Third		.50
Red	"	Third		.50
Festiva Maxima	E. A. Farmer, Minneapolis	Third		.50
Dark Pink	" "	Third		.50
Light Pink	" "	Third		.50
Red	" "	First		2.00
Seedling Peony	B. T. Hoyt, St. Paul	First		3.00

F. H. STACY.
FRED COWLES, Judges.

COLLECTION OF ANNUALS.

Collection, Annuals	Mrs. H. B. Tillotson, Eureka	Third	2.00
Collection, Annuals	Mrs. Chas. Krause, Merriam Park	Second	5.00
Collection, Annuals	Mrs. H. A. Boardman, St. Paul	First	7.00

COLLECTION OF PERENNIALS.

Collection, Perennials	Mrs. Frank Moris, Lake Elmo	First	7.00
Collection, Perennials	Mrs. Chas. Krause, Merriam Park	Third	2.00
Collection, Perennials	F. H. Ellison, Sta. F., R. 2, Mpls.	Second	5.00
Collection, Perennials	Jewell Nursery Co., Lake City	Fourth	1.00

ANNUALS AND PERENNIALS.

Iris	Mrs. H. B. Tillotson, Eureka	Third		.50
Lilies	" "	First		2.00
Foxgloves	Mrs. J. F. Fairfax, Minneapolis	First		2.00
Iceland Poppies	" "	Third		.50
Forget-Me-Nots	" "	Second		1.00
Sweet William	F. H. Ellison, Sta. F., R. 2, Mpls.	First		2.00
Sweet Peas	" "	First		2.00
Iceland Poppies	" "	Second		1.00
Pansies	" "	First		2.00
Gallardias	" "	First		2.00
Lilies	Mrs. John Gantzer, St. Paul	Second		1.00
Canterbury Bells	Mrs. S. R. Spates, Wayzata	First		2.00
Iceland Poppies	Mrs. E. W. Gould, Minneapolis	First		2.00
Forget-Me-Nots	" "	First		2.00
Iris	Mrs. S. A. Gile, Minneapolis	Second		1.00
Delphinium	Mrs. J. E. Stryker, St. Paul	First		2.00
Pansies	Mrs. H. A. Boardman, St. Paul	Second		1.00
Sweet William	Mrs. Frank Moris, Lake Elmo	Second		1.00
Lilies	" "	Third		.50
Forget-Me-Nots	" "	Third		.50
Pansies	" "	Third		.50
Shasta Daisies	Mrs. Chas. Krause, Merriam Park	First		2.00

AUG. S. SWANSON, Judge.

STRAWBERRIES.

Bederwood	Thos. Redpath, Wayzata	First		1.00
Sen. Dunlap	Dr. O. M. Huestis, Minneapolis	Second		.75
Sen. Dunlap	A. Brackett, Excelsior	First		1.00
Seedling	Mrs. M. A. Rohan, Minneapolis	First		3.00

CHAS. HARALSON, Judge.

Digitized by Google

Dedication of Gideon Memorial Tablet.

A. W. LATHAM, SEC'Y.

The very appropriate tablet which had been prepared by the Native Sons of Minnesota commemorating the life and work of the late Peter M. Gideon was unveiled and dedicated with appropriate ceremonies on the old farmstead, where he passed the last forty-six years of his life, at 2:00 o'clock on the afternoon of Saturday, June 15th.

Considering the threatening weather there was a generous attendance. About twenty-five members of the Horticultural Society were present and probably more than that number of the Native Sons of Minnesota. Others living in the vicinity brought the number there up to approximately one hundred. The memorial consists of a block of granite, raised on a platform of solid concrete, surrounded by a chain supported by a number of black iron posts. On the sloping top of the stone is a bronze tablet bearing this inscription, "This Tablet Commemorates Peter M. Gideon Who Grew the Original Wealthy Apple Tree from Seed on This, His Homestead, in 1864. Erected by the Native Sons of Minnesota, June, 1912."

The triangular piece of ground on which this was placed, containing approximately a half-acre, is surrounded by a chain and post fence. It stands on the main traveled boulevard between Excelsior and Minnetonka Beach, a few hundred feet south of the Manitou station on the electric line. The proportions of the memorial are excellent, and it impresses one as being especially fitted for the purpose for which it was designed.

The program was carried out in full as arranged, and follows here in detail. The remarks as noted are not strictly verbatim but are in most cases nearly so.

1. Invocation by Rev. C. J. Swain, Pastor of the Congregational Church, Excelsior.

2. Presentation of deed to "Gideon Memorial Park," in which the tablet is erected, by Mr. C. E. Armstrong, representing the donor, Mr. O. P. Briggs. "Mr. President and Native Sons of Minnesota: The American people are known throughout the civilized world as hero worshipers. We give the greatest credit to that hero who gives up his life that others may live. Many heroes' lives were given up that the lives of women and children might be saved regardless of nationality or race or condition in the loss of the mighty Titanic. To my mind the man who lives for mankind is no less a hero than he who dies for man. We are assembled here today to do honor to one of the heroes of Minnesota who lived for men. There are many here

Digitized by Google

who are better qualified to speak of the character of this man than myself, but I am requested by the donor of this property to present to you, sir, Mr. President, and through you to the Native Sons of Minnesota of Minnesota, a deed to this triangle to be called and named 'Gideon Memorial Park,' and which shall forever remain so. The donor states that he is only adding and giving his mite in loving remembrance to this hero of Minnesota who lived for man, and personally I am gratified to be the chosen one to evidence this act of generosity in memory of one of Minnesota's true heroes, Mr. Peter M. Gideon."

Gideon Memorial Tablet, from photo taken on day of dedication.

3. Acceptance of deed by Martin F. McHale, President of the Native Sons of Minnesota: "On behalf of the Native Sons of Minnesota, and as president of the organization, I accept with deep thanks and a high sense of gratitude the deed to the 'Gideon Memorial Park.' I desire through you, Mr. Armstrong, to thank the donor for the gift of this beautiful park on which the tablet in honor to Mr. Peter M. Gideon is to stand. In behalf of the Native Sons of Minnesota I want to thank all those who have assisted in this work today; I want to thank you all for your presence here this afternoon, and especially I wish to thank the committee, Dr. W. E. Leonard, Charles Gluek and David G. Gorham, who have made the preparations for this occasion. These annual outings of this kind serve to keep us more

Digitized by Google

together. I feel quite convinced that our organization has justified its right to existence. We are now ten years old, which is quite a period in human events. We have done already some things of historical character. Sentiment has had much to do in bringing us together and keeping our organization alive. We want to keep in memory places of earlier days. We want to hold in veneration the worthy characters of the North Star state. Permit me to say briefly as to the occasion which bring us here together this afternoon, we are gathered on this spot to do honor to a distinguished citizen, with particular mention of the Wealthy apple tree, by placing a suitable tablet in this park on the shore of Lake Minnetonka. Mr. Peter M. Gideon ranks as one of the benefactors of his race. We are pleased to do him, as the originator of the Wealthy apple, this act of commemoration. We are glad to have some of his friends here."

4. Unveiling of the tablet by Mrs. Florence Gideon Webster, daughter of Mr. Gideon.

5. Address of dedication by the Hon. Geo. R. Smith, Judge of Probate, Hennepin county: "In 1858, when this state was admitted to the Union, our population was only 125,000; today it is two and one-fourth million. The material progress of the state has kept pace with us. We have the greatest school system and greatest school fund of any state in the Union. In 1858 there were no native sons. Today they are occupying positions of trust. The important work which the state of Minnesota has done is largely due to the courage, the patriotism and sacrifice of the early pioneer. Such a person and pioneer was our distinguished friend and pioneer, Mr. Peter M. Gideon. He was a typical pioneer. He became famous by developing the Wealthy apple, which is today one of the finest and best apples in the world. It is fitting that this tablet should be erected by the Native Sons of Minnesota as a just tribute to the honor which his courage brought to the work of Minnesota.

6. Address of Thos. E. Cashman, President Minn. State Hort. Society: "No more fitting or lasting tribute can be paid by a grateful people to the memory of a man who has done much for posterity than that which this organization is bringing to a successful conclusion this afternoon. It has been stated that we do not fully appreciate the good done by our fellow beings until long after they have passed and gone, and few of us accomplish more than is expected, so that when we have laid down our life's work we are soon forgotten. But not so with Peter M. Gideon. He was appreciated while living, for he compelled a credulous public to admit that by his untiring efforts and self-sacrifice he had given the nation a fruit not only of par excellence but hardy enough to withstand the severe climate of the Northern States.

"As time advances the results of his labor are brought to our attention more and more, and the erection and dedication of this tablet by the Native Sons of Minnesota is the result of the universal appreciation of thousands of people who are enjoying the fruits of his labor. The world is richer for something it had not before he came and would not have had if it had not been for the determination of this man to produce a good quality of apples which are hardy.

Digitized by Google

"In carrying out his purpose he deprived himself and family of the necessaries of life, for, as the story goes, he sent the only $8.00 he possessed, at the beginning of a hard winter, to a man in the state of Maine in exchange for a bushel of apple seed, and the results of this sacrifice and effort on his part was the origination of the Wealthy apple, which is proclaimed by most fruit growers to be one of the most profitable autumn apples grown in the United States.

"Some years ago certain members of the Minnesota Horticultural Society contributed their mite by voluntary subscription, amounting to $500, which they deposited with the Board of Regents of the Minnesota State University with instructions that the interest from this fund be expended annually as prizes in connection with the study of horticulture at the State Agricultural College and Farm School. As this fund is in perpetuity, this memorial is of the most lasting character. While the fund is not large, it was donated mostly by men who are not rich in this world's goods and therefore shows most clearly the appreciation the members hold for this scientist who, during his life, was the guiding star in horticultural work in this and other states.

"The members of the Minnesota Horticultural Society are proud of the fact that Mr. Gideon was once a member. His enthusiasm and his success have been an inspiration to all who were fortunate enough to come in contact with him or study his work. If Mr. Gideon had not lived, Minnesota could not boast of being one of the leading apple states of the Union, and if we were to eliminate the varieties bequeathed us by him, untold millions would be lost to Minnesota, and thousands of her children could not truly say 'Minnesota, my cherished state, not only the foremost in the production of bread and butter but among the best for good fruit.'

"It is therefore my great privilege to stand before you today as a representative of over 3,000 loyal horticulturists, known as the Minnesota State Horticultural Society, to commend you, the Native Sons of Minnesota, for the erection of this tablet to the memory of Mr. Gideon on the very grounds on which he carried on his chosen work. It is not only a deserving tribute to his memory but will be an inspiration to future as well as present generations."

7. Oliver Gibbs: "A record of the life and work of Mr. Gideon and of the estimation in which he was held by his neighbors and associates is given in the annual report of the Minnesota State Horticultural Society for the year 1900, supplemented by the proceedings of a meeting held a year later, I think, to raise the fund spoken of by Sen. Cashman. Immediately after the introduction of the Wealthy apple a tract of land was purchased here on Lake Minnetonka, and placed in charge of the Board of Regents of the State University, as an experimental orchard in which Mr. Gideon could freely continue his work of producing new varieties and of placing them on trial to see if he could extend the fruit beyond the period of the season of keeping of the Wealthy. He was made superintendent of this farm under authority of the Board of Regents and given a small salary, and to them he made a report once a year.

Digitized by Google

"Late in the year 1882, when I became secretary of the Horticultural Society, I found that Mr. Gideon was not in accord with our society. He did not attend our meetings, and we only knew of his work by the reports we had of him through the papers and copies of the reports we would get from the University of Minnesota, and it is one of the pleasures of my memory that I was enabled, with the president of the university, Wyman Elliot, Col. Stevens and others, to bring about a reconciliation with Mr. Gideon. I visited him at his home here in Excelsior the summer of that year, and there made my first acquaintance with him and became highly attached to him. The following winter at the annual meeting of our society, Mr. Gideon came in. The meeting was held at the State University, and I think it was the largest and the best held in the state. Scores and scores of citizens came in there to be present by serving with us to give him a greeting. When he came in escorted by a committee he was accepted with such great recognition that it was called the Gideon love feast. A short time subsequent to that Mr. Gideon made us an address, giving us a full account of his work and promising his full co-operation with us in the future.

"A short time, I think, two years, previous to this, the fame of the Wealthy apple having gone abroad, he visited the horticultural societies of the middle and eastern states and gave an account of his work. He took with him his wife, Mrs. Wealthy Gideon—the original Wealthy—whom, by the way, in the year 1884 we had made also an honorary life member. The next fall when I met members of the American Pomological Society at Philadelphia, many of them told me how much they learned to love these two farmer-like people from Minnesota, and how much they appreciated our work.

Mr. Gideon was a peculiar man, but he was honest, he was kind and sincere. One thing I love to recall about him: he was a lover of children and of flowers. Little children thronged his place, and nothing pleased him so much as to give them fruit and flowers. If the old man should find a little boy in his apples trees stealing apples, he would call him gently down, fill his pockets with apples and send him home with an admonition to plant the seeds. We are glad to know that although he had made many successes, spent all his earnings in the early part of his work and refused money for everything except one variety, he had belted the earth with apple trees, and if he were with us today, Mr. President and members of this society, I think nothing would please him better than to see that the Native Sons of Minnesota have erected this monument to his memory here on the spot where he loved to work, not for fame or for money but for the benefit of his fellow men."

8. J. M. Underwood: "I am not on the program for an address, but I am glad to say a word on this occasion to commemorate the memory of Peter M. Gideon. I came to this state forty-four years ago and have devoted all my time ever since, or the most of it, for the special purpose of trying to find apple trees that would be hardy enough and good enough to furnish the fruit for this great Northwest. I was associated with my brother-in-law, Dr. P. A. Jewell. Dr. Jewell was

Digitized by Google

trying to do the same kind of work that Peter Gideon was working for, and so I naturally came in touch with and interested in the work which Mr. Gideon was doing. I will not detain you with any speech this afternoon, but it did occur to me that you would like to know that the Wealthy apple has twice taken a first premium at the Spokane fair in competition with fruit from the middle states. Twice the Wealthy apple has taken the first premium over all its competitors, and I think that that certainly would please Mr. Gideon if he could realize it today. I consider it the best apple there is in the world, in quality, in beauty, and I think anyone that is familiar with it will certainly believe as I do. It is a pleasure to be here on this occasion and come in touch with the work of the Native Sons of Minnesota in honoring Mr. Peter M. Gideon. I was greatly interested in the work of the Horticultural Society to raise a fund the interest of which should annually be a tribute to his memory as a prize for the work done in our State Agricultural School. We didn't raise as much money as I wanted to see raised—I wish there had been $5,000 instead of $500—and I feel as though the people of the United States were small in allowing that fund to remain there at $500. I would like to contribute more and wish we could make it $5,000."

9. Mrs. Florence Gideon Webster: "I am sure my father would be gratified beyond measure by this expression of respect. He was an independent man, but he did appreciate recognition of his fellow men."

10. Wyman Elliot: "I am not a public speaker. I want to relate one instance—that I saw the first peck of apples that was put on exhibition at the fair that was ever exhibited from that tree, and I at that time thought it was the most beautiful apple that we had ever seen in the state, and today I say that it is the most attractive, the best flavored and the most profitable apple that we have in Minnesota."

Why do aster buds blast on apparently healthy plants?

Mrs. Gibbs: I think that the buds blasting on apparently healthy plants was a mistake, as I don't think that they were healthy or they wouldn't blast. There was either some insect at the root or some trouble of blight.

How may the radish be protected from the worm?

Pour a weak solution of tobacco water over the plants.

An old barn was torn down, the top soil was removed to fill in a low place; seeds were then sown where the barn had stood. As fast as they sprouted the small plants were apparently burned up. This has occurred two years in succession. What does the soil need?

Put on some good soil, change the nature of the soil, clay or some sand. It would seem that the barn covering the ground had formed an unnatural condition; lime is suggested, also turning it up to the air.

Digitized by Google

MIDSUMMER REPORTS.

Minnesota State Fruit-Breeding Farm.

CHAS. HARALSON, SUPT.

June 13, 1912.—The winter of 1911 was very severe on many semi-hardy varieties of fruit, and even some of the hardier varieties show the effect of it.

The N. W. Greenings are nearly ruined. Apples are a light crop. A number of the apple seedlings have set a few fruits which will be watched with interest.

The selected Beta grape seedlings came through the winter without any injury, and a good crop of grapes is expected.

Plums and plum hybrids are setting a heavier crop than last year, and with favorable conditions several hundred bushels of plums will be harvested.

Strawberry seedlings are in the very best condition to produce a good crop, and the same is true with all other small fruit.

Pear seedlings killed back to the snow-line with very few exceptions.

A large amount of seed from various fruits has been planted this spring. Four and one-half acres have been planted with plum pits, to be used mostly for stock to propagate some of the best varieties of plums. Over 600 plum seedlings from last year's plant-breeding work are up and making a rapid growth. Among them are some very interesting combinations, and the same is true with apple and small fruit seedlings.

Plant-breeding has been carried on nearly all winter and spring under glass. A large number of seeds are the results from this work. Some breeding is being done at present on roses, grapes and raspberries.

Several varieties of the most promising raspberry and strawberry seedlings have been planted out this spring to increase the stock for distribution. Some of the best plum seedlings are being propagated as fast as possible.

Several varieties of winter apples top-worked on Hibernal and Patten's Greening two-year-old grafts are fruiting; some have set a few specimens, others are very full of fruit.

No spraying has been done this spring, and several other things had to be abandoned on account of the fact that funds are very limited

Digitized by Google

to carry on the work as it should be. We do not like to make a commercial enterprise of the fruit farm, but this year we will have to depend on money received from sales of berries to a certain extent to carry us through.

Much is expected from this farm, but it takes money for labor, supplies and suitable material for plant-breeding. The state should be very liberal with appropriations, otherwise results will come very slow.

Central Trial Station, St. Paul.

PROF. LEROY CADY, SUPT.

Trees, shrubs and plants came through the winter in very good condition at Central Station with the exception of a few varieties. Spiræa Van Houtii was probably injured more than anything else. We have, however, had many specimens in blossom and find that those that were killed to the snow line have sent up new growth and give every promise of being in good condition next season. Weigelia, which ordinarily is injured quite badly, came through the winter showing scarcely any bad effects. The large hedge or Alpine currant was severely injured, although the new growth has come on nearly as good as ever. Cotoneaster acutifolia came through the winter in fine condition and is proving an especially desirable shrub, both as a hedge plant and as a shrubby bedding plant. The Black Hills spruce, obtained from the Black Hills a number of years ago, are proving good shrubs for specimen plants.

A great many oak trees have been taken off the Campus the past spring and others are showing the effect of borers and will have to be removed in the very near future.

The May-day tree and Pyrus baccata are two of the best ornamental flowering trees on the campus this spring.

The building of a new horse barn has taken part of our garden plots so that it will be necessary to use other land.

Practically all of our apple and plum trees have come through the winter in excellent condition, although a very light crop of apples is expected. Only a small proportion of the trees has blossomed and is setting fruit. Plums blossomed heavily, and a good crop of fruit has been set. This is true also of currants and gooseberries.

A very nice block of seedling peonies are in bloom.

During the past fall and spring a large addition has been made to the dining hall and to the girls' dormitory, and the Mechanical Engineering building is in process of construction.

Digitized by Google

Collegeville Trial Station.

REV. JOHN B. KATZNER, SUPT.

It is becoming monotonous to commence invariably the summer report by telling you what kind of weather we had last winter. And yet to show its effects on fruit trees and plants it seems necessary to say a few words about it before entering upon the subject matter of the report. That the winter was excessively cold everybody knows, and with us it was no exception. At Collegeville the temperature was fluctuating between 20 and 40 degrees below zero for fully three

Rev. John B. Katzner, Supt. of trial station at Collegeville.

weeks, from Jan. 1st to 21st, without any intermission. Plants and trees which endured that cold without being seriously injured are certainly hardy enough for Minnesota.

It may be stated in a general way that all fruit trees and plants, with the exception of the hardiest varieties, were more or less injured by the bitter cold. Of the apples the Russian varieties with some of their seedlings, Duchess, Hibernal, White Russet, Charlamoff, Patten's Greening, Okabena and a few others, along with the hardy crabs, are among the number of the least injured. Quite a few terminal buds can be found on the large trees that did not grow this spring, and in an effort to overcome this injury the trees force out and grow new buds about the frozen ones. Other trees not quite so hardy froze back

Digitized by Google

an inch or two. Of the trees received from Prof. Cady and planted last year, the Delicious, King David and Senator are about dead, but the Hibernal and Gould crab are doing well. The plum trees of native origin are in good condition and bearing. Prof. N. E. Hansen's hybrid plums are certainly very hardy, and some of them set a little fruit, although the trees are still very small. The pears and apples received from the U. S. Dept. of Agriculture froze down to the snow line. There is, however, one Chinese pear among them which I think was not injured, as the wood was not discolored, and the tree started a vigorous growth. The Russian pears which bloomed last year froze a part of their buds last winter. In the nursery all trees, even the Duchess, froze down to the snow-line. A neighbor of ours lost all his Wealthy trees. They had just power enough to leaf out and then failed. One of my two larger pear trees suffered quite a little; the other is doing well.

My pear seedlings set out last year in the orchard did not fare any better than the small apple trees in the nursery. I am satisfied that the wood of all of them, even the hardiest, is more or less discolored. Most of them froze down to the snow-line and started their growth a foot above ground. Yet there are among the 500 seedlings some thirty or forty trees which are not injured so badly. Some lost only the terminal bud, others froze back from one to three and more inches. This will not discourage me but rather spur me on to further trials. All of these which froze down will be used as stocks and be grafted with those which came through last winter fairly well. No doubt the pear seedlings would have suffered still more had they not been protected by laths and deep snow. As to location I find that pear trees pass through winter in better condition on higher grounds with a clay subsoil and a good windbreak on the north side. The same may be said of apple trees.

Our grape vines were not attended to last fall, and as a result they too froze down to the snow line. Even the Beta, which is considered entirely hardy throughout the state, froze down the same way. Mr. J. Gillitzer, of Collegeville, told me that he lost all of his Beta grapes, for not only the vines but the roots too were frozen. He is quite discouraged and will never plant any more Betas. The Alpha was not injured. Spireas and other ornamental shrubs suffered severely; they were cut back to healthy wood.

Besides the cold doing injury to trees and plants, the field mice were very active under the deep snow, gnawing off the bark from young trees, and where they could not get at the trees under the snow they came up through it to satisfy their appetite. Never before have

Digitized by Google

I noticed the mice doing so much injury to young trees as last winter. Then as a closing exercise of winter, a heavy hail storm passed over Collegeville on May 3d. Many leaves, buds, spurs and small branches were knocked off, the bark was broken in many places along the branches, exposing the bare wood, and in general the trees were badly injured.

White pine and Norway spruce on grounds at Collegeville.

We had an ideal spring this year for planting trees. It could not have been better. The ground was well soaked from the melting snow, and the subsequent heavy rains during May gave all vegetation a good start. Spring was rather late in coming, and no heavy frosts injured the blossoms and new growth on the trees. Not many fruit trees were planted this season. We set out a dozen of Prof. N. E. Hansen's hybrid plums, which were grafted last year on native stock.

Digitized by Google

About thirty pear seedlings were set in the orchard and 250 plants of the Alpha grape, which had been rooted in the greenhouse, were planted directly into the vineyard among the wild grape-vines, which later will be removed. Our forestry plantation was extended. We have raised about 3,000 Scotch pine seedlings. They being three years old were planted six feet apart each way on Observatory Hill, east of the institution, to improve the landscape.

As on a previous occasion the members of the conservation club were invited to help in planting the evergreens. The members of the club, being classical students and inexperienced in tree planting, were lectured to for half an hour on how evergreens ought to be planted to make them grow. The work was shown them practically in the field, and they became quite interested in it. As a result of the previous instruction it may be said that nearly all the Scotch pine seedlings planted by these students are in fine growing condition. Of course the heavy rains of six inches during the month of May materially helped along their initial success.

The way leading to the cemetery is rather exposed to the northwest winds, and in winter it is sometimes very disagreeable to walk in that direction on account of the bitter cold. To obviate this a double row of Scotch pine seedlings were planted along that road on the west side, and these pines, no doubt, will give us the much desired protection in a few years. Just east of the institution were two rows of Lombardy poplars along a semi-circular walk on the crest of the shore overlooking the lake. These trees had become rather unsightly and shabby with age. They were all cut down this spring and in their place were set out fifty white elms of two to two and one-half inch caliper. They will make a fine shady walk and will last for many years to come.

Only a few root grafts were planted in the nursery this season. A few trees were stem-grafted, and five varieties of pears from Chinese Turkestan, which we obtained from the U. S. Dept. of Agriculture, were planted for a trial. A seedling of a prunus insititia, that is, a hybrid of a plum and a sloe, which is hardy at Collegeville and bore a a heavy crop last year, was set on native plums. The seed of that hybrid plum was imported. Then eight beds were re-seeded with Scotch pine and a few hundred pines, being too small for setting out, were re-planted in the nursery. Besides there are about 1,500 white spruce seedlings which will be large enough for next year's planting. A good deal of general ornamental planting in flower beds on the lawns about the buildings has been done as every other year. Some large maples and other trees obstructing the view from the buildings or overtopping desirable evergreens were removed.

Digitized by Google

The outlook for a good fruit crop is not very bright. There will be some strawberries, currants, plums and probably a few cherries. Of apples we will not get many as this is an off year with us, and not many trees were in full bloom; but as the season is very favorable for trees to grow a better crop may be expected next year.

Duluth Trial Station.

A. B. HOSTETTER, SUPT.

I find fruit conditions much better in the vicinity of Duluth than we had anticipated, considering the severe winter just passed. With the exception of a few trees which were planted last spring and which

Lilac at residence of Wilson Palmer, at Lakewood, on shore of Lake Superior.

undoubtedly had not gotten a good start sufficient to mature their wood before winter set in, I find practically no injury done to the fruit trees and shrubbery of this section.

At S. Geo. Stevens' place, at Fond du Lac, I find the young Duchess trees killed back to about half the length of the limbs. The Transcendent crabs are in good condition. Martha crabs, tips slightly frozen. Whitney No. 20 in excellent shape. Longfield, slightly damaged.

Digitized by Google

Charlamoff, in fair condition. Compass cherries uninjured and setting considerable fruit.

On Mr. Wm. Tabor's place, in Woodland, an addition of Duluth, I find the Duchess, Wealthy, Okabena, Patten's Greening, Hibernal, all in splendid condition and setting more fruit than they should really be allowed to bear this coming season. Florence, Transcendent, Hyslop and Siberian crabs are in perfect condition and setting an abundance of fruit. Gooseberries, currants, raspberries, including black-capped varieties in same section, have all wintered well and are promising full crops this season.

On the Jean Duluth Stock Farm some of the younger fruit trees were badly tipped by the cold weather. Was unable to designate varieties which suffered most at this location. The strawberries were late in coming into bloom, but at this writing, June 12th, they show an unusually large number of blossoms with prospects of setting a liberal supply of fruit. There will also be in this vicinity a good crop of wild strawberries and wild raspberries.

Shrubbery of all kinds withstood the winter remarkably well. A few roses that were unprotected were frozen back to within a few inches of the ground. We attribute the good condition of our fruit and shrubbery to the fact that we had an abundance of snow for the entire winter. The early spring being cool, blossoms did not sprout until all danger of frost was past. We may anticipate, therefore, a liberal supply of all kinds of fruit for this immediate territory.

Our only misfortune is, we are not in possession of more orchards. Indications at present lead us to believe it is worth while to plant more apples of the hardy varieties in this territory, believing they will give good results if proper attention is given to their cultivation.

If you are buying large clumps of peonies for reasonably quick results would you recommend making at least two clumps of the one clump? Yes, divide them.

In autumn and early spring do you favor mulching the peony? If so, with what? Cultivation is always better than mulching; good cultivation is the best thing for them.

Do you favor mulching the peony with lawn clippings in June before blooming? I would dig around them and cultivate them rather than mulch them with the clippings of lawn.

Do you favor spring cultivation of the peony up to blooming? Let that cultivation be very shallow.

Digitized by Google

Glencoe Trial Station.

A. H. REED, SUPT.

McLeod County has a much better prospect for an abundant crop of nearly everything except corn than last year at this time. The plum crop bids fair to be heavy and the apple produce fair. Several frosty nights have occurred since the blossoming season commenced, but I cannot learn that any damage was done to the fruit crop.

The abundant moisture last fall, and an average volume through April, prepared our soil in the best of condition for bringing our fruit trees through a severe winter in the best of condition, and although but little rain fell through the month of May there is moisture still in the ground to keep things growing as fast as our very cool weather through April and May permit; consequently everything is backward.

Although we have experienced one of our coldest winters, the thermometer going as low as 38 degrees, every variety of apple trees has come through the winter without injury, whether set on low, moist ground or on that more elevated. I did no mulching to my trees during the fall and winter and never had them come through in better shape and in a healthier appearance, although many passed through the winter with their leaves on, and some of the old leaves hung on until the new leaves forced them away.

My three-year-old trees, from root-grafts set in nursery row, of such varieties as Wolf River, York-Imperial, Gano, N. W. Greening, Red-Regan, Aiken, Rome Beauty, Tallman Sweet and others came through the winter without freezing back any, which convinces me that a low temperature will not kill even young apple trees if their wood ripens up well, and they go into winter quarters in moist soil.

To save my Jonathans, Baldwins and Northern Spys from killing back, I dug them out late in the fall and heeled them into the ground, leaving the tops sticking out not to exceed a foot, which brought them through all right, and re-setting them again early in April they are starting to grow in their fourth year.

I am still strong in the faith that we must obtain our long-keeping apples and can do it by top-grafting into bearing trees, and that it makes but a little difference as to what variety you graft onto if it is a healthy and vigorous growing tree.

I have top-worked the Jonathan, Baldwin, Roxbury Russett, Northern Spy, which have had from one to four years' growth, and upon a thorough examination this spring have failed to find one scion killed back if it lived and made the first year's growth.

Digitized by Google

I have top-worked about one hundred trees the past spring, using scions partly obtained from Iowa and Maine; and principally of the following varieties: Jonathan, Baldwin, Roxbury Russett, Northern Spy, Delicious, King David and Winesap.

I find the catalpa and the horse chestnut among my most valuable shade trees. I have planted during the spring more profusely than ever before of forest trees, fruit trees, shrubbery, small fruits and flowering bulbs and shall watch their growth and condition next spring with increased interest. My trial varieties have been Carolina poplars, catalpas, elms, hackberry, Russian mulberry, Russian olives, honey locust; purple berbery for hedges; quince, peaches, pears, plums, Mercereau blackberry, spireas, gladioli, dahlias and other flowering bulbs.

Every tree, shrub or bulb put in the ground this season is growing finely, and I anticipate much pleasure in watching and seeing all the new varieties mature.

The peonies obtained from Brother Harrison, of York, Nebraska, two years ago, are sending out beautiful bloom this season.

Jeffers Trial Station.

DEWAIN COOK, SUPT.

June 10th, 1912.—There has been no unusual injury to fruit trees and shrubs at this station by reason of the very cold winter of 1911-12. There is less injury apparent at the present time to many varieties of fruit than there was a year ago. This will apply especially to plum trees, natives, Japanese hybrids and sandcherry hybrids. All varieties bloomed full, which was not the case the season of 1911.

The plum crop will not be large—many of the native varieties are bearing only scantily or not at all. The Forest Garden, however, has set for a fine crop; the Surprise, of which I have a number of large trees, bloomed full (they did not bloom the spring of 1911), but the blossoms all blighted. We have not seen a Surprise plum for several years.

We had thought that the hot, dry season of 1911 had entirely destroyed the rot fungus (monila) which causes the plum blight, but I guess we were mistaken, as we are now having a great deal of the plum blight in the blossoms and twigs of many varieties. This blight is mostly confined to and adjacent to the older plum plantings that are well sheltered by trees. There is little plum blight on the younger trees that are growing outside of a general windbreak of trees. The

Digitized by Google

Japanese-American hybrid plums as a class are behaving splendidly this season. All of them are bearing, most of them are set for a full crop, whether growing inside or outside of a windbreak. The one exception to this rule is the Eureka, which is bearing well in a sheltered place, but owing to its not being quite hardy is not bearing so well in a windy location. Those large, fine hybrid varieties, the B. A. Q. and the Emerald, are bearing heavily wherever I have them growing.

Prof. Hansen's hybrid, the Hanska, is bearing a good crop. Of his sandcherry hybrids, the Opata seems to lead them all at this time. The other varieties of sandcherry hybrids will all bear some, but, like many of our native varieties, there are a great many very small plums on the trees. They stick to the trees but do not seem to grow. We do not know what they will do, but expect most of them to drop.

There was no winter-killing of apple trees, but we will have no apples or crabs to market this season. Evidently the foliage was so poor the summer of 1911, owing to the severe drouth, that the trees could not develop fruit buds, regardless of whether or not they bore last season. As a rule there was no bloom on the apple trees this season, but the foliage is good now, and all apple trees are growing finely.

We have several trees each of several varieties of cherries. They all wintered in fair condition, and the prospect now is for a fair crop on all the trees. The varieties are: Bessarabian, Early Richmond, Montmorency, English Morello and Homer. These trees were planted nine years ago. None of them have ever borne any fruit until this season, except a few trees bore some specimens the season of 1911.

We have not lost much shrubbery by reason of the severe cold of last winter; I am not certain we have lost any. We have several fine spirea Van Houtii that failed to put forth any foliage except in spots, but we think this was owing not to the cold of winter but rather to the drouth of 1911.

We also had to cut out a few more black spruce trees, 12 to 15 feet high, that failed to grow this season. They also evidently were struck with death by the drouth of 1911.

Raspberries wintered well, and what few bushes we have—there are several varieties of them—promise a good crop. Currants are looking the best for years. Perfection is extra fine. Strawberries will not be very much unless we get rain. It's rather dry in this locality, although we have had several nearly dry rains (or rather mists). Frost the 7th of June will cut in on the strawberry crop. We also had a hard frost about the 14th of May, when the plums were in full bloom.

Digitized by Google

Madison Trial Station.

M. SOHOLT, SUPT.

The spring of 1912 was one of the most favorable seasons we have had for a long time, good weather and just enough moisture to give the trees and plants a good start.

The apple trees came through the winter in fine shape with the exception of the two-year-old Northwestern Greenings, which froze back a few inches. All blossomed fairly well except the Wealthy and Hibernal trees; on these trees there were only a few blossoms.

In my estimation there will be a medium crop of apples. I think the frost two years ago and the dry summer last year is the cause of the trees not blossoming as well as they should.

All the scions of the Delicious, Lowland Raspberry and King David, sent this station a year ago and top-worked, came through the winter in fine shape.

The plum trees that blossomed early the last days of April were touched a little by frost. Those that blossomed later, including the Prof. Hansen hybrids, are loaded very heavily with fruit.

Raspberry, gooseberry, currant bushes and strawberry plants bear very heavily this year.

Most of the hardy shrubs froze back more or less this winter but not enough to hurt them much.

All perennials came through in good condition, and give promise of having an abundance of flowers. Everybody should plant more or less of these beautiful flowers, such as peonies, phlox, columbines, Shasta daisies and hardy oriental poppies.

REPLANTING OLD ORCHARD.—On the site of an old orchard last spring after the field had been staked out, and the holes dug large and deep, some good fresh, virgin soil was hauled from a piece of timber land and about a bushel of it was put at every hole. The trees were set right in the new soil; they started in a very short time and made a splendid growth. These trees were set in a field that had been planted to vetch the previous fall, so after the trees started and vetch was large enough it was plowed under. The weeds were kept down by frequent harrowing, until it was again time for the sowing of vetch, which in turn was turned under. It is my belief that the trees will develop finely if the application of vetch is continued, even though the soil is of the lightest sandy texture.—Michigan.

Digitized by Google

Montevideo Trial Station.

L. R. MOYER, SUPT.

June 18, 1912.—The only new material supplied to this station this year is the Tetonka rose, originated by Prof. Hansen, said to be a cross between a wild rose found on a lake border in South Dakota and a hybrid seedling of Rosa Rugosa. The names of the South Dakota wild roses are not well known. The roses of the timber borders have been variously identified as Rosa Woodsii, Rosa Fedleri, Rosa Maximiliani, Rosa blanda and Rosa Solandui. This last name is applied by the New York botanical barden to the common timber border rose found throughout western Minnesota. It is a rose of considerable vigor and has been used with much success by one of our neighbors as a hardy stock on which to graft the tender roses. Prof. Hansen's rose is growing finely and promises to be an acquisition.

After a winter of unusual severity it is interesting to find that fruit trees have come through the winter with as little loss as usual. One of our best trees, purchased as "Anisette," but which proved to be an Oldenburg, died; but this may be attributed to the fact that the tree stood near a screen of buckthorn and so probably suffered from the severe drought of the preceding season. The Wealthy trees have set no fruit, while the Peerless are promising a fair crop; so Major Reed may fairly consider himself endorsed. There is a promise of a fair crop of apples on the Oldenburg, Anis, Simbrisk, Pride of Minneapolis, Virginia and Hibernal.

The outlook for plums is good. The trees have been sprayed with a dust spray of lime and sulphur. There is no evidence of curculio or plum rot. Plum pocket has appeared on wild plum trees but not on the sprayed trees in the garden.

The currant and gooseberry bushes have now been sprayed with the lime-sulphur dust spray for two seasons and never looked so well or promised so good a crop before. We had always been troubled with a leaf fungus that seemed to cause the leaves to drop in mid-summer. The dust spray seems to control this disease.

A large tree of Prunus padus comutata, often called the May-day tree, died, probably from drought. Smaller trees in the city parks are looking well. It is fair to say, however, that many trees of native choke-cherry died too.

Young spiræa Van Houtii suffered greatly in the park plantings, evidently due to the deficient precipitation of 1911. They are sprouting vigorously and promise to recover.

Digitized by Google

For planting on springy ground where deep cuts have been made through heavy clay soil nothing has succeeded better than Cornus san-

Spray of blossoms from the May-Day tree. From the State Exp. Station.

Digitized by Google

guinea and Salix Uralensis. This latter is a shrubby willow, with blueish, glaucous leaves, and is strikingly beautiful.

For planting along river banks the golden willow has been used with success. The merits of some of our native willows for such locations ought not to be overlooked. Our native sandbar willow is the natural protector of river banks, while Salix cordata and Salix discolor are large shrubs of much beauty. Sometimes they make beautiful the borders of highways across bottom lands; but it is hard to keep the highway overseer with his brush hook from destroying them. Shepheria argentea, the buffalo-berry, is doing well as a river bank shrub.

At this season of the year few shrubs make a better appearance in our park plantings and borders than the Caraganas. For a screen about a porch or outbuildings few shrubs are better than Caragana frutescens. It seems strange that this species should be so little planted. Few nurseries offer it for sale. It propagates itself by seeds and from root sprouts, much like Caragana pygmae. In this respect both of these species differ from Caragana arborescens, which seldom sends up root sprouts. Caragana microphilla is very dwarf and would be well adapted to plant around the foundations of a house along with Berberis Thunbergii and Polygonum Seboldii.

Among old fashioned hardy flowers we know of few that will give more satisfaction than Dicentra spectabilis. It stays in bloom for a long time, its racemes elongating, and new flowers continuing to appear. One who has a shady corner in his garden can bring in from the woods its sister plant Dicentra cuculata and be assured of an early spring flower that deserves a more euphonius name than Dutchman's Breeches.

It is now seventeen years since 8,000 pine seedlings were set out on two acres of land at this station. The planting was done under the direction of Prof. Fernow, then head of the Forestry Department of the United States. The seedlings were not set so thickly as he recommended, but they are much too thick now. The most rapid growth has been made by Pinus sylvestris, the trees now being about twenty-two feet in height. The best looking trees in the lot are Pinus nigra (Austrian pine). They are from sixteen to eighteen feet in height, with spreading symmetrical tops, and very beautiful. We did not get so good a stand of Pinus scopulorum, partly because they were set with nurse trees of deciduous varieties, and partly because the scopulorum seems to be a harder tree to transplant. They are, however, from ten to twelve feet high and bid fair to be strong, healthy trees for a long time to come.

Digitized by Google

Nevis Trial Station.

JAS. ARROWOOD, SUPT.

All trees and shrubbery came through last winter in good shape with very little loss. The spring has been backward and rather cold and wet. The plum crop is to be rather short. Rain and wind came in plum blossoming time and caused the young plums to fall off. We expect the crop to be less than last year. What we lose in one thing we make up in another, so we will get a good growth on the trees.

Jas. Arrowood, wife and daughter.

We have many apples, especially the seedlings are very full. The loss on apple trees for the year does not exceed four per cent, and the cause of death is mostly due to sun scald, which was confined mostly to the Wealthy. The trees that were killed by sun scald were not protected. They were mostly two-year-old trees, so we have no reason to get discouraged.

The trees that I received from the Central Station came through fairly good, except one King David died back about half way, but it has sprouted out nicely. Two Senators did the same thing, but were partly dead when we received them.

All the stock from Prof. Hansen has done remarkably well. It is bearing this year.

In regard to top-working, I think it is the proper thing to do. Last year I top-worked one of my hardy seedlings with the King David

Digitized by Google

that I received from the Central Station, and they are doing finely. It is my opinion that this is the way to get our winter fruit.

No blight so far at this station. All trees and shrubbery have done fairly well throughout this section.

We had a very cold winter. The thermometer reached about 40 below zero, but the ground was covered with snow all winter long. Grapes are doing well at this station. Strawberries and gooseberries and raspberries are doing fairly well and are heavily loaded.

Crops and gardens are doing fairly well, taking into consideration the cold and backward spring.

In regard to soil and location, trees stood best in well cultivated land well sloped to the north. All trees that stood on this slope have made the best growth. In regard to soil, we think a clay loam is best. Our own land is a sandy loam with a hardpan under. It is my opinion that the Wealthy has suffered the most all through the country. The Wealthy will do better top-worked on some hardy stock, Hibernal or the Virginia crab. We have been experimenting with the Duchess on the wild crab which seems to be a success. I grafted six Duchess on the wild crab roots two years ago, and I have a wonderful growth.

Owatonna Trial Station.

THOS. E. CASHMAN, SUPT.

June 19, 1912. The winter season of 1911-12 will go down in history as one of the most severe on apple trees known to the oldest settler. The winter was not only severe, but the summer of 1911 was also most unfavorable. In the early part of the summer little or no rain fell, and the trees made but little growth except where they were thoroughly cultivated. About September 18th, and continuing up until freezing weather, we had an abundance of rain, which filled the sloughs and lower lands to overflowing, so that when winter set in the ground was thoroughly saturated with water, particularly so on flat lands. This excessive moisture in the latter part of September caused trees and plants that had made but little progress during the summer to take on a new growth, and when winter came they were in a soft and weakened condition, and the semi-hardy and tender varieties were greatly injured. Many of them will die before the season is over.

Such experiences teach valuable lessons: first, that we do not want to get it into our heads that varieties that would not stand the average winter twenty years ago will do any better now; second, that we must plant our trees on high land where the ground

Digitized by Google

will not become overly saturated with water during wet periods, for apple trees will not stand wet feet any length of time. If high land is not available, a complete system of tile drainage should be installed.

Every farmer should have at least a few trees of the Hibernal, Virginia or Yellow Siberian crab, that have been top-worked with better varieties by the nurserymen, or if he does not wish to pay the price learn to top-work himself. It is like raising thoroughbred stock. The only way to obtain the highest degree of success is to have the foundation secure and of the best quality. Experience has taught us that we must have a hardy stock, as well as a hardy root, for a foundation on which to grow good fruit, and in order to obtain a good quality of fruit, and have long lived trees, we should top-work into the tops of hardy two or three-year-old trees.

It is a rare thing to find semi-hardy varieties of apple grafted into Hibernal or Virginia crab injured by severe winters, and we seldom ever hear of these varieties being injured from any ordinary cause; therefore they make a safe foundation on which to grow our apple fruit.

Most trees at the Owatonna Experimental Station came through the winter without any apparent injury and will bear some apples this year. I have stated in former reports that the seedlings at the Owatonna Station were extremely hardy, and their ability to withstand the past year, without apparent injury, proves my statement. It is a fact, however, that trees planted on the low lands at the Owatonna Station are badly injured, and some of them may die, but those planted on higher ground, taken as a whole, are in excellent condition.

It appears that the injury to the trees was caused during the month of January. There were twenty-nine days during that month that the thermometer did not go higher than 40°, and it was close to the 30° mark at some hour each day during that time. The trees were injured on the trunks at a point just above the snow level.

I would advise those whose trees are looking sickly at this time to cut them off within four or five inches of the ground. If this is done, in all probability a new shoot will come up above the graft, which will become a bearing tree again much sooner than if a new one were transplanted in its place.

There was but little injury to other kinds of fruit trees, shrubs and plants in this locality, with the exception of spirea Van Houtii, which was killed to the ground last winter. Where these were cut down close to the ground they are making a strong, vigorous growth and will be as good as ever in a year or two, but where this has not been done the entire shrub may be destroyed. Shrubs and plants of low growing habit were covered with snow most of the winter and therefore came through in excellent condition.

Digitized by Google

Paynesville Trial Station.

FRANK BROWN, SUPT.

Justice to all compels us to say that the Wealthy suffered most of all the apple trees. A few trees have left us entirely; others have a sad look that speaks of a loss of healthy vitality.

Other trees that we thought iron-clad have suffered to a certain extent. The Homer cherry never lost a limb before, but now several fine trees here at station are dead. Others are somewhat injured, while about one-half of them are in fine shape and loaded with fruit. Some will say it was the winter, others, that it was too late cultivation; some, that it was lack of cultivation, etc.—but we think none of these theories are correct.

The year 1910 had no rainfall that went down over six inches. The winter of 1910-11 had very little snow, and the spring of 1911 had no rainfall until May 14th. It rained frequently after this with very heavy rains in the fall until freezing weather set in. Consequently, trees, shrubbery, etc., grew until too late to allow the wood to harden sufficiently to resist old "Winter's blast." The results are too evident. However, the bulk of the trees are showing signs of recovery, and, with plenty of rain, we hope for the future.

One thing is very noticeable, and that is, that the trees on low ground have suffered most. This is not altogether true, but to a great extent.

Neither has general hardiness been a safeguard against winter's ravages. Pattens Greening, with its wonderful record, suffered with the rest to quite an extent. To sum this matter up, three factors must be considered: First, the terrible drouth; second, an immense crop of fruit, that must have reduced the vitality of the trees; third, a very cold winter and spring.

A good physician is supposed not only to locate the disease, but to suggest a remedy. How *can* we do this? Some cultivated trees suffered, others did not. Uncultivated ones fared in about the same proportion; some of the hardiest suffered, while some tender varieties came through unscathed. Especially did we notice this with the catalpa, which always freezes back in this locality (or has until this year) when it came through without the loss of a bud.

Top-worked apple trees were entirely uninjured. Strawberries wintered in splendid condition. We left a part of the bed of Koronis strawberries uncovered, without the loss of a single plant. Where hail has not damaged them, all strawberries will be a good crop.

Digitized by Google

Apples, plums and cherries will be a light crop this year, while small fruits of all kinds promise well.

Spirea Von Houtii suffered greatly, except some that stood entirely in the open, which were not injured in the least.

Of the seven varieties of honeysuckle here at the station, none were injured. Hydrangeas wintered in fine shape, as did the sixteen varieties of evergreens growing here. The syringa suffered greatly; some died to the ground, others half way, and some were alive to the top bud. What caused this great difference in the same variety?

Most perennial flowers came through in fine form. Of the 50,000 peonies growing here on the home grounds, not one was injured and at this writing they are a sea of beauty.

It has been generally advised in planting commercial orchards not to use more than one or two varieties, but in view of the fact that even the hardiest are sometimes injured, it might be well to add a few more varieties, with the thought that all might be injured, but probably not all be injured at one time. This same thought might be applied to small fruits and ornamental planting.

Waterville Trial Station.

SETH H. KENNEY, SUPT.

We find to date forty Wealthy apple trees that look as if they would be at a fair crop, and eighteen Transcendent crab trees that will be at a fair crop. On my highest ground I have four trees of Meader's Winter that have all died; they bore a heavy crop last fall. They are about thirty years old, and I had counted them hardy. Close beside them are four Duchess. One of the four seems to be injured on one side. Of the grafts I got from Washington that bore one-year-old grafted on Patten's Greening, part have died. I have some left, but none blossomed this spring. The Duchess trees grafted eleven years ago with Malinda are as a rule looking well but not bearing this year. The tree the cyclone broke in three pieces—that bore about twenty kinds of winter apples—two of its limbs that rest on the ground and hang by the bark have leaved out but no apples this season.

The apple trees in this section will have but little fruit, but most of them came through in good condition. The soil is a black loam, clay sub-soil and slopes to the north. Most of the winter we had considerable snow, which lay evenly in the orchard—and considerable mulching material—but the Meader's Winter that died was never

Digitized by Google

mulched. Some of the Seek-no-Further apples have kept to the present time. The Bottle Greening scions from Vermont six years ago have proved a good keeper. The trees top-worked with Pound Sweets on the Peerless are in good condition. I never could grow these apples before I top-worked the Ben Davis on the Gould crab. Several other kinds have come through in good condition.

I set a new orchard of seventy-five trees this spring. Have grafted a good many Jonathans, some Grimes Golden, some Delicious, some King David and other kinds, all enclosed in woven wire fence to keep out rabbits and chickens. In this enclosure I have fifteen kinds, mostly plums, Prof. Hansen's new fruits. This is the second year that they should be well loaded with fruit. It looks to me as though these fruits will be of immense value to this state. I am taking excellent care of the fruit trees, and it is a great pleasure to see so much fruit on so small trees. If "variety is the spice of life" I expect to have it this season. Hansen's hybrid cherries bore bountifully last season, blossomed full this spring, but a frost took them all. These I shall try to cover next spring, as they had the same experience as the plums. The Hansen plums stand the early frosts the best.

Yellow Siberian crab tree grafted four years ago, with seventeen grafts, at Mr. Kenney's.

Raspberries, black and red, bid fair to be a good crop. The Sunbeam, of Prof. Hansen, are later this season than the black and are proving more hardy at this station. Bushes set this spring have blos-

Digitized by Google

somed. This seems to be a trait of this berry. I have also set out quite a lot of the Carrie gooseberry, also Morton seedling gooseberry, white and red currant, also a few Pan-American strawberries for trial. I have set Sen. Dunlap strawberries and three other kinds for trial. I have set several hundred Norway poplar cuttings, eight inches long, and set them between fence posts to use as posts when large enough. In the fall I think I can tell more about the Hansen fruits. To date they are very promising.

A very large Whitney No. 20 crab. at Mr. Kenney's place, bearing twenty-one bushels in 1911

I forgot to mention the Wealthy apple trees stood the hard winter to perfection, notwithstanding the heavy crop last season. The winter of 1884-5, when I lost forty-eight Wealthies out of fifty, the thermometer went to 40 degrees below zero for about one week continuously. The fact of so many bearing apples after the full crop last season speaks well for the Wealthy. The Jonathan on Hibernal is bearing again after bearing last season.

Some of my peony stalks decay at the surface of the ground. What is the cause and the best remedy? Ground too rich. Cultivate more and don't fertilize so much.

Digitized by Google

West Concord Trial Station.

FRED COWLES, SUPT.

After a severe winter we are all anxious to see if any varieties succumbed to the severe cold, but on our grounds we have found but very little damage done. At the time the ground froze last fall the ground was very wet, and we have a black prairie soil, with a clay subsoil, and I believe that this accounts for everything wintering so well. The strawberry plants came out in fine condition and are promising a heavy crop. Part of my plants were covered, and part were not, but I can see no difference from the effects of the winter on the two patches; however, we would recommend covering strawberries always in the fall.

Raspberries came through in prime condition. The varieties that we have are King, Iron Clad, Older, Sunbeam and Herbert. The last named sort was sent to us from Canada. To test them we covered part of them last fall and part we left standing, and those that were not covered leaved out to the terminal bud. We consider the Herbert hardy after standing a winter like last. The quality of the fruit is recommended to be of the best; we can tell better after ours fruit this season.

Prof. Hansen's new plums came through the winter in fine condition, and most of them are carrying some fruit. Our top-grafts of the Delicious apple killed back some, which might have been caused by too late a growth last season. The top-grafts of King David, Lowland Raspberry, Superb and Evelyn, came through with no injury. These were all put in one year ago.

We have failed to see but very little injury from the effects of the severe winter in the orchards of this locality. We find Yellow Transparent and N. W. Greening hurt some, but other varieties are making a fine growth. The apple crop will be light—Peerless will be the best on our grounds. Plums will be a fair crop.

In flowering shrubs, the spirae Van Houtii was injured the most, being killed to the snow-line in most places, while other hardy shrubs seemed to stand well. We have several catalpa trees that we have been watching for several years, as they have seemed to be very hardy. We thought that last winter would be a good test for them, and find that they have leaved out to the terminal bud. We are propagating from these trees and hope to find them as hardy as the parent trees.

The Chinese iris that we received from China is very hardy and has a very pretty blue flower which is very fragrant.

Our Chinese clematis is also hardy without winter protection and has a very pretty flower.

Digitized by Google

Testing Station of Mr. James Arrowood, Nevis, Minn.

M. J. DORSEY, PLANT-BREEDING EXPERT, STATE EXP. STATION, ST. PAUL.

The writer had the pleasure of visiting the fruit testing station conducted by Mr. James Arrowood, at Nevis, Minnesota, on May 25th. This station is located on what may be termed the frontier, horticulturally speaking. The soil is a rich sandy loam. The jack pine comprises a large part of the native evergreen forest of the region, but others, as well as quite a variety of the hardwoods, are also found.

Of the wild fruits of interest may be mentioned the plum, chokecherry, pin-cherry, blueberry, cranberry, strawberry, grape, etc. The wild strawberries were just in bloom on the above date, and, judging from their abundance, one would be liable to get the impression that the whole region was a natural strawberry patch.

Mr. Arrowood has made a study of the wild fruits of the region with special attention to the plum. He has been searching the surrounding country for late blooming plums, and on May 25th all of the wild plums of the region had bloomed, probably at least a week before, while nearly all selections growing in his orchard were in full bloom. To those who are familiar with the damage often done to bloom by late frosts in this northern region, the wisdom of selecting late bloomers will be evident. While the blooming season of all fruits is much shorter in the north and lengthens as we go south, the advantage of only a few days will in many cases mean a crop or *no* crop.

Besides selecting desirable wild plums and testing them under cultivation, Mr. Arrowood has a number of crosses which he has made. A number of combinations are found in these, and to date they have proven hardy—a valuable asset to any plum for this region. One of his best plums has been named Blush. This plum has received favorable comment from a number of horticulturists who have tested it. Besides the crosses and seedling plums, a few apple seedlings are setting fruit for the first time this year. Judging from the appearance of the trees several of these are very promising. One of the best of his grape crosses has been propagated and distributed to a limited extent. Others are still under test. Apples grafted on different stocks are being grown here for comparison.

Several varieties of apples, plums, grapes, currants, one or two of peaches, besides the seedlings, are being tested out for that locality. Information as to the relative merits of varieties is valuable for any region, and local planters may do well to profit by this work. There are a number of men located here and there over this state, as in others, who are finding out first hand information regarding the adaptability of fruits to their particular locality. The writer wishes to express an appreciation for such work in closing. Reports from Mr. Arrowood regarding his work will be looked for with interest by many who are interested in hardy fruits.

Digitized by Google

Plums for Minnesota Planting.

W. J. TINGLEY, FOREST LAKE.

The wild plums were very plentiful on the wild lands when I settled on my farm, and from the best of these I selected for a plum grove, setting them on a low, moist piece of ground near a spring, that being the same kind of soil that the trees were taken from. These trees, without care or cultivation, gave me plenty of fruit for a number of years. The quality was not first class, but still it was fruit, and that was the principal point those days.

Joining the Minnesota Horticultural Society in 1891, I commenced to plant the improved varieties of the Americana plum, such as the society then recommended. Planting them in a sheltered position on good, high ground, they were cultivated for about five years and then heavily mulched with strawy manure. Then the ground was allowed to grow to grass. These trees bore two or three fair crops and then became barren and a few years later were grubbed out. Being not a bit discouraged, I set thirty more trees of the following varieties, Stoddard, Wyant, Mankato, Surprise, Rollingstone, DeSoto, Cheney, Rockford and Freestone Wolf. These trees have always had clean cultivation and in winter a light mulch from the chicken shed. The mulch was spread in the spring, the ground plowed shallow, harrowed fine and planted to a garden crop. The rough bark on the trunk and large branches of these trees is scraped off clean every two years and lime-sulphur wash applied every year.

These trees have been out eleven years and from the Stoddard trees we have had eight crops, four light and four heavy. Rollingstone did well on the start, but as the trees grew older the crops became lighter.

I first became interested in the Japanese hybrid plums by reading Mr. Dewain Cook's report from Jeffers trial station. Getting scions of Emerald and Eureka from Mr. Cook, I set them into some young Weaver plum trees. They made a good growth and the second year the Eureka bore quite a few plums. The foliage of the Eureka appears to be good and the plums a fair quality and early.

In 1909 I received of Mr. Cook scions of a number of Japanese hybrid plums. One that he calls B. A. Q. fruited in 1911 and appears to be promising.

When I look back and think of the quality of the fruit that we grew in those early days, then think of the grand fruit exhibit at the Minnesota State Fair in 1911, the question in my mind is, is this really Minnesota? And the answer is, Yes, Minnesota is not only a "bread and butter" but also a fruit state.

Digitized by Google

THE VEGETABLE GARDEN

Seasonable Notes for July

By H. J. BALDWIN, NORTHFIELD

This is the month that much of the early spring planting of vegetables will be marketed where not needed at home. There are so many people who have no garden and hence must buy of others. These same people are always on the lookout for strictly fresh vegetables. If they pass through several people's hands they become high in price and stale as well. Private sales can be made remunerative to the producer and very welcome to the consumer. May I give you my method?

Our city of 3,400 is largely made up of people of good homes and who live well. As almost all have good refrigerators they can usually purchase all the vegetables they need on three days of the week, so I make the trip to some sixty families every other day, leaving me the other days to care for truck farming. These customers must not be fooled with poor stuff. Usually through July some of the berry crops are leaders, peas sell well with them, head lettuce is much the best for hot weather, radish with the tops off and carried in a pail with ice water are attractive and sell well—no one wants the tops in the ice box; beets bunched while the tops may be used for greens, carrots, small onions and early celery the latter part of the month. A constant study is made of the wants of people. Let alone what they don't want.

I believe it good policy to always encourage boys and girls in our homes to raise and sell what they can as an education as well as to help out their own pocket money.

One trouble we find in our smaller towns and cities—the stores do not want to pay money for truck and are apt to favor the one that is in debt to them. May the day soon come when small vegetables will command a cash price as readily as wheat!

Let's look to the garden for a few minutes now. Did ever anything taste better than the first new potatoes? Keep cultivating often, and they will soon appear.

The late celery will need setting early in the month, while the early variety will be going to market.

Just a word about muskmelons, and we will close for this month. If the bug fight has succeeded well the cultivating must be frequent and rather shallow, keeping farther away from the plants each time. Irrigation pays well if one is fixed to get the water to them. A forkful of manure by each hill to put water on and let it soak through both for mulch and fertility. Sometimes the melon louse appears on a few plants at first. It is good policy to destroy these rather than doctor them. Nic-O-Fume used, one spoonful to one gallon of water, is one of the best louse-killers. If any one has a good remedy for boys please pass it along.

Digitized by Google

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by Mrs. E. W. Gould, 2844 Humboldt Avenue So., Minneapolis

Keep the faded flowers picked off. This will prevent seeds from forming, which means a more vigorous plant and a longer season of bloom.

Dahlias and gladioli can still be planted for September bloom. By cutting back the hybrid perpetual roses after the June blooming and fertilizing well, a second crop of roses is insured.

Geraniums for next winter's blooming should be selected now, but see that they do not blossom this summer. Pinch out every bud at the earliest stage but encourage a growth of foliage.

Cut your flowers every day in the cool of the morning and put them in tall jars up to their necks in water. They will last twice as long as when cut in the heat of the day.

Stake gladioli, dahlias, hollyhocks and cosmos in anticipation of those storms that come in July and August.

Pansy seed sown now gives earliest bloom next spring.

As the early sowings of flowers come into bloom, provision for their succession should be made by sowings during July of all hardy and half hardy annuals. They will give flowers right up to the frost, making your garden look fresh and cared for when others are ragged and bare.

Plants in bud, or even in bloom, can be successfully transplanted by watering copiously, then lifting carefully and wrapping the ball of earth about the root in tissue paper. Set into the ground without removing the paper and shade for a few days. Often a plant moved in this way does not even wilt.

Look in the yucca flowers at night for the little white moth, without whose help it would be impossible for these plants to make seeds.

Premiums for Spraying the Orchard.—It is interesting to know that the Illinois State Horticultural Society are offering premiums, now for the second year, for the best sprayed orchards, premiums running from $50 down to $10, such orchards to consist of not less than twenty acres. The following score card is to govern the committee in making the awards: scab, 20 points; other fungous diseases of foliage and fruit, 5 points; curculio, 15 points; codling moth, 20 points; other insect injury to foliage and fruit, 5 points; freedom from spray injury, 15 points; size and color of foliage, 10 points; size and color of fruit, 10 points.

The asparagus bed needs frequent cultivating, especially on account of the summer rust that does so much damage these late years. I believe it a good plan to raise one's own plants so as to not get the disease from the nurseries. If the rust comes on bad in hot weather, I believe it is best to cut off and cart away the tops and let it come up again, otherwise the plants are apt to die. Sometimes a spraying of lime-sulphur solution diluted one to thirty seems to check the disease. I believe it would be a fine plan to manure just after the cutting season to encourage a strong, hearty growth.—H. J. Baldwin.

Digitized by Google

SECRETARY'S CORNER

SECRETARY'S OFFICE HOURS.—During the months of July and August the secretary is expecting to be in the office on Mondays, Wednesdays and Fridays. Except two weeks in July, when the assistant will be away on her vacation, the office will be open every week day during regular office hours, except on Saturday afternoons.

TRIAL STATION REPORTS—The mid-summer reports of the society trial stations are taking up an unusual amount of space in this issue, but they are of correspondingly unusual interest and will well repay careful reading by our members. The results of the peculiar season just passed are here noted, and many valuable suggestions which should be of much practical value are made by the superintendents in these reports. To the writer they especially teach this lesson: *tile drain the orchard* and make a thorough job of it.

INCREASED CROP FROM SPRAYING.—A test made by the Missouri State Board of Horticulture, including several hundred orchards, indicatse an average price per bushel of apples from the sprayed orchard of 61.7c and from the unsprayed orchard 49.3c, a difference in results which would pay the probable expense of spraying many times over. In commenting on this the report says: "Now if to the above we add the fact, proven by experiment, that spraying increases the yield of merchantable fruit an average of two to three bushels per tree in orchards ten to twenty years old, also the extra cost of picking and sorting where the per cent of good fruit runs low, it becomes apparent that spraying as an orchard practice is very profitable indeed."

PROGRAM OF THE ANNUAL MEETING.—Considerable material has already been gathered for this program. The secretary desires in preparing it to follow out the wishes of the members as far as it can be ascertained, and would be glad of any suggestions as to topics to be considered, as well as the names of those whom it would be desirable to call upon to present these subjects. It is yet early for this preparation, but experience shows that it is advisable to ask for suggestions a considerable time before making up the program. Please do not be over modest in advising the secretary as to your wishes in the matter, and there may be even some subject you yourself would like to present that we should be more than glad to find place for.

TOP-WORKING OLD TREES.—Mr. O. E. Dahlen, of Albert Lea, writes: "I find top-working old apple trees a poor investment. We have to cut too big limbs, and the old bodies will rot. I had an old Hibernal with nice head of Milwaukee and Windsor Chief that was my pride. This last summer when it was loaded with half grown apples it blew down, all rotted in the body except a thin shell under the bark. Have killed a dozen old trees that way, some I destroyed in one year, others in two or three years. As long as we can whip-graft a young tree it is all right, but to change an old tree twenty-five feet high with whip-grafting without cutting big limbs is too much for me. It is all right to put a scion in the old tree to try varieties, as it cost less than to plant the trees and wait ten years or more to find out what you got—even if it dont prove hardy on its own root."

Digitized by Google

Digitized by Google

S. A. BEACH,

Professor of Horticulture, Iowa State Agricultural College and Experiment Station, Ames, Ia.

Digitized by Google

☞After reading this magazine, will you please pass it along to some friend who will appreciate it and whom you may perhaps interest to become a member of the society—at least he should derive benefit from its reading. By distributing in this way the twelve magazines received during the year 1911, at the beginning of the next year, upon renewing your membership in the society you will be entitled to receive postpaid a cloth bound volume containing all the magazines for 1911 and much other interesting matter, with a full index of all its contents, entitled "Trees, Fruits and Flowers of Minnesota," a handsome book for your library and invaluable for reference.

THE MINNESOTA HORTICULTURIST

Vol. 40. **AUGUST, 1912.** **No. 8.**

Orchard Management.

S. A. BEACH, PROFESSOR OF HORTICULTURE, IOWA STATE AGRICULTURAL COLLEGE, AMES, IOWA.

In speaking of orchard management, from what standpoint shall the question be discussed? From the standpoint of what is good for the hog—whether or not the orchard makes a good pasture for hogs? Or shall we discuss it from the standpoint whether it is a good place for a meadow? Shall we discuss whether an orchard is a good place in which to keep sheep? What is it we wish to grow in an orchard? Apples. Right! Then we will consider the question from that standpoint. Each one of you may have different ideas as to how orchard management can be applied on your place. If you have the hog point of view, if you have the sheep point of view, if you have the meadow point of view, in connection with your orchard, why then it is for you to decide what is best for the orchard from the hog, sheep or meadow viewpoint, but we here will discuss the matter only from the standpoint of that management which is going to give us the longest life for our trees and the most and best fruit, leaving each one to adapt the management to his own peculiar needs.

I was much interested in what Mr. Underwood said to you a little while ago about soil management. I believe that that is more than half the battle for the Minnesota fruit grower, providing he has made a selection of hardy varieties for his orchard. The next question is the study of soil requirements for the plant. We can control the soil better than we can the air. There is something which may be done in the way of fighting frost, but we can do more towards controlling the soil than we can with any other one factor in the environment of the orchard. We can do something in the way of protecting foliage against disease, do something in the way of protecting plants against insects, and we can do something in the way of pruning trees so as to give the leaves a better chance to do the work they ought to do, but

Digitized by Google

it appears, as was said before, that more than half the battle is in handling the soil.

I have often thought what an advantage it would be if every man who contemplates the growing and handling of an apple orchard could have a year or two of experience in a commercial greenhouse, so that he could get it drilled into him that plants must have water at the right time if they are to do well. In the west, where they pay for water for irrigating their orchards, what do they do in order to make the most of it? The general practice is to cover the ground with a mulch of dust made by stirring the surface of the soil. The dust mulch holds the moisture in the ground. That practice is common among our leading horticulturists in many sections of the country. Mr. Underwood

Orchard of the Iowa Experiment Station, where clean cultivation is practiced during the growing season. Fire pots in position as used for orchard heating in 1911.

has told you of Mr. Yeomans' orchard, near Palmyra, New York. On a farm about the same distance west of Rochester as Palmyra is east is located a Baldwin orchard planted out in 1877. The trees are forty feet apart. In the year 1903 I made an arrangement with the owner of that orchard to put it under experiment for the purpose of getting some information on the question of whether it was better to handle the orchard with sod and cut the grass and let the grass and weeds fall as a mulch on the ground, or to use the dust mulch system by giving the ground thorough cultivation, pulverize the soil during the growing season and then put on a cover crop about the first of August to help catch the snow and hold it during the winter to protect the ground, and then turn that under in the spring to add vegetable matter to the soil, which would make it more spongy and better able to hold moisture. In other words, the purpose was to compare what we call the sod-mulch method of handling an orchard with the tillage and cover crop method.

Digitized by Google

This orchard being planted in 1877 was then about twenty-five years old. It had been in sod until about 1901, when the present owner of the orchard, Mr. Auchter, bought it. Up to that time it had not been productive, but it had not been handled in the way it should have been handled. Mr. Auchter asked my advice as to what to do with it. I told him I believed the best thing to do was to break up that sod and put it under cultivation, and he did so. The next season after he put it under cultivation he received nearly two thousand dollars from his crop off of that orchard of about ten acres. Becoming interested in the orchard in this way I then learned that it was quite uniform in its soil conditions, and after some negotiations this particular orchard was selected by the Geneva Experiment Station for an experiment to run ten years. This work was started in 1903 and is not yet completed. At the close of seven years, however, Professor Hedrick, my successor at Geneva, put out the results of the two methods of management, one by the sod mulch and one by tillage and cover crops, which is shown in this table:

(For table see page 317.)

The average annual cost per acre of handling by the sod method was $17.92; by the tillage method it was $24.47; making a difference in cost of $6.55 per acre in favor of the sod method, as far as the actual expense of operation is concerned. But we are not through with the comparison when we simply consider the expense of running the orchard. The next item is the average annual income per acre for these years. The first year after it was put under experiment the results were about even, and we should bear that in mind in considering this average. The orchard was of a somewhat oblong shape and was divided lengthwise into two equal sections, or halves. One-half was seeded to blue grass and orchard grass, and the other half was kept under cultivation. The portion of the orchard that was in sod gave during the five years an average income per acre of $71.52. The portion that was under tillage gave $110.53, making an increase in the average annual returns of 54 per cent. per acre. Is that not a good return for the money invested? Does that not pay well for the extra care required?

Now what are some of the reasons for these results? What made this difference? In that part of the country the time when orchard trees are most likely to suffer for lack of water is in the dry summer season. This may start as early as the latter part of June, and more or less drought may be experienced in the months of July and August. These are the months in which they are most apt to have the growth of the tree checked by dry weather. After the growth is checked it takes some time to start again. Even after rain does come the tree does not

Digitized by Google

make the same steady, vigorous growth it would have made if it had had sufficient moisture right along, as any man who is at all familiar with the growing of fruit will tell you. In 1907 and 1908, 120 determinations were made of the moisture of the soil in this orchard in July and August, as measured in tons per acre for one foot in depth of soil. In the sod there were about 104 and under tillage about 167 tons per acre on the average for both years during July and August, which is an increase of 60 per cent. for the tillage over the sod plat. This is not far from the percentage of increase in annual net income from the fruit in the tillage plat for the five-year period. In this case it has paid to hold the moisture in the soil by frequent cultivation. Apples are very largely composed of water, and as combined in the apple water can be sold at good profit.

There is another factor which has to do with the vigor of the growth of the tree, and that is temperature. As a matter of fact, the records of the experiment show very conclusively that the soil is cooler under the grass than under clean cultivation. The average soil temperature during July at a depth of twelve inches was 65 degrees, and under tillage it was 67 degrees, two degrees higher than it was on sod. The higher average is decidedly on the side of better growth. An apple tree will make better growth at 67 degrees than it will at 65, other conditions being equal.

Next we come to the question of humus. By that we do not mean just vegetable matter turned under, but vegetable matter decayed and going down into a friable condition, one in which it holds moisture better and gives up its fertility more easily. That is the difference between manure and humus. Manure is not humus, but manure will change to humus. Surprising as it may seem, analyses showed a larger amount of humus in the tillage plats, where cover crops were used, than in the sod plats, where all the grass was mown and left to fall back and rot where it was cut. The soil in the first 6 inches of its depth showed in July and August an average of 2.4 per cent. humus in the tillage plat and 2.2 per cent. in the sod plat, a gain in favor of tillage of .2 per cent., which signifies an increase of 1.8 tons of humus per acre.

Aside from the evidence given by the fruit, we had evidence in the circumference of the trees and other ways of the differences between the trees under the two methods of tillage. The diameter of the trees that were in the sod showed an average annual increase of only 1.1 inches, while those under tillage increased 2.1 inches annually. That is perhaps the best illustration we can give of the difference between the two methods.

Digitized by Google

Mr. E. Yanish: Did you fertilize besides using a cover crop on the part that was tilled?

Prof. Beach: Some fertilizer experiments were conducted. The orchard was divided lengthwise into two sections, and cross strips were fertilized with different kinds of fertilizers on different sections. The fertilizers did not give the results which were expected, and after three or four years that method was discontinued. The tillage portion and the sod portion received the same kind of treatment with fertilizers in each case.

Col. Burnap: What cover crops did you use?

Prof. Beach: Sometimes Mammoth red clover and sometimes oats.

Mr. Miller: Do you say that orchard was about twenty-five years of age when it began to bear?

Prof. Beach: It was planted in 1877. It was reported that although it bore some fruit previously it did not bear a good crop till 1903, when Mr. Auchter first plowed it.

Mr. Miller: Is it probable that it would have yielded earlier if cultivation had been started earlier?

Prof. Beach: Probably so, but I am not in a position to give as definite an answer to that question as I would like. I must fall back on general observations and my views of the subject to support that statement. I should be glad to hear the views of these men here in Minnesota who have tried that. From the standpoint I spoke of a while ago, I should say this, that if your tillage is such as to give the tree a good, steady and continuous vigorous growth throughout the growing season it has the best chance to develop fruit buds for a crop the following year. Whether the tree will then bear or not will depend greatly on the variety and upon your local conditions, or local environment, which I do not understand in your case. If you have trees of a good size they will generally continue thrifty and vigorous under thorough tillage; but, on the other hand, if they are not kept in such a vigorous growing condition, if the growth is repeatedly checked, they do not set fruit buds so well, and in that case it would be well to try this method to bring them into a more productive condition. One objection to intensive cultivation with young trees is that it may continue the habit of too vigorous growth longer than is profitable. A tree which is in that habit of growth is less apt to be making fruit buds. The trees must reach some degree of maturity before they begin to set fruit buds. When a tree is making excessively vigorous growth it is not in the best condition to form fruit buds, but it makes leaf buds instead of fruit buds.

Mr. A. B. Lyman: Can you give us a comparison between Minnesota and Iowa?

Prof. Beach: I have not the figures.

Mr. Lyman: That would be of more importance to us than the New York comparisons.

Prof. Beach: I know very little about orcharding in Minnesota, and I would not attempt to say how much of these principles you can take to yourselves in your work, but of this I am sure, that if you want

Digitized by Google

to get growth on your trees, if you want them to get good foliage, if you want them to have the ability to set fruit buds, if you want them to develop blossoms in the spring, you must give them plenty of moisture through the growing season. You may have plenty of fertilizers and give your trees an abundance of them, but they cannot use these fertilizers unless they have moisture with which to dissolve them so that they may be taken in by the roots. This question of moisture is at the base of the fertility problem. If the soil needs fertilizers, and you do not get an increase in crop as a result of applying proper fertilizers, you should then follow the method of tillage so as to give the trees a liberal supply of moisture throughout the growing season to make the fertility available to the plant.

Mr. S. D. Richardson: Would you plant a growing crop between the fruit trees or in the apple orchard when the trees are of a bearing age?

Cover crop of buckwheat and Canada field peas in young apple orchard of the Iowa Experiment Station. All these varieties shown in photo are top-grafted on hardy stock.

Prof. Beach: That is also a local question. I should want to answer that from the standpoint of how you wish to supply to the soil with necessary moisture. In irrigated regions you can supply it from the irrigation ditch whenever the ground needs it. If you live in a region where there is a plentiful and timely rainfall you can hold enough water in the ground, both for the orchard and the other growing crop, but if you are living in a region where there is not an abundant supply of water for the crops, where semi-arid conditions prevail, it would not be a good idea to grow any other crop in the orchard except the orchard trees and fruit, and whatever cover crops may be needed.

Mr. Underwood: There is another feature that enters into this question of supplying moisture right along this line that I have been speaking, and that is the matter of hardiness. In the last forty-three years that I have been interested in orcharding in Minnesota—and you will bear me out that when we are talking about hardiness of a tree we are talking about the hardy varieties—and in this connection the question comes up as to what constitutes a hardy variety of apple tree. I

Digitized by Google

think it means the tree that has the best drouth resisting ability. I think we have drouth in winter as well as we have in summer, and in winter the alternate freezing and thawing will expel the moisture from the roots, and in consequence of the continued winter drouth, as we may call it, the roots of the tree become destitute of moisture—and there can be summed up the whole question of winter-killing. It may dry out in winter time as well as in summer time, the trees starve both ways. Now I want to ask you if you do not think that tree that has got plenty of moisture in it, that is to say, moisture in the soil,, and is in good condition, whether that tree, so far as the question of hardiness is concerned, is not more likely to go through a severe winter when the thermometer gets down to forty degrees below zero than it has if it stands in dry conditions.

Prof. Beach: With one modification that statement is very good. The question is whether it will not go into winter quarters in good condition if plenty of moisture is supplied. I want to say that if you stop tillage early in the season so the wood will ripen up well your proposition is very good.

Mr. Underwood: If you have a dry season, and there is no moisture in the soil, if you do not cultivate in the moisture you will find that your moisture at three feet deep will evaporate. In our orchard we keep the ground stirred all the time, and we find moisture within half an inch of the surface, and if we go into a grain field where the soil has not been cultivated I can demonstrate to you that there is not a particle of moisture within three feet of the surface. If you can keep up cultivation during the summer months—when the summer is dry, during July, August, September and October—if those late months are dry we must still keep up the moisture. If you will cultivate you will have a good growth. That I know from experience. If it is a wet season you do not have to keep up the cultivation, but if it is a dry season you must keep the moisture there, and if you do not have any better way of doing it you had better irrigate your field before it freezes up.

Prof Beach: That is done in the West; there they irrigate when they are afraid of winter drouth.

Mr. Underwood: Prof. Beach has reminded me in his talk of the experience I had, and which I did not mention, with George T. Powell, whom Prof. Beach knows. Mr. Powell is a keen observer, and he has a big farm near Albany, and we drove over this farm together, and I want to bring out this same matter that I have been trying to bring out here. I wanted to find out what cultivation would do, and I wanted to ask him while we were driving over his orchard as to his experience in this direction. We came to some beautiful orchard trees, probably twelve to fourteen years old. They were fine trees, nice, handsome and vigorous looking, and I asked him the question what he thought was best in the matter of cultivation. I noticed he had his ground free and clean of sod, and I wanted to find out particularly what his views were as to which was the better method, cultivation or non-cultivation. He smiled a little and did not reply right away, and he did not say anything until we had driven on a little farther. Then he said, "Now I will let you answer that question for yourself." Here there were four-

Digitized by Google

ten or fifteen rows of trees that had been given over to some authority of the college—I do not remember now who it was, but some official of the horticultural department had taken charge of them—and they were trying to demonstrate why cultivation was the best method. Mr. Powell said, "I will let you answer that question for yourself." I could see a very marked difference between the same varieties of trees, the same age, the same condition, where one side was cultivated thoroughly and the other side was down in grass. The trees did not look as healthy and the fruit was smaller where uncultivated, and everything indicated that the trees needed moisture.

Mr. W. B. Richardson: To conserve the moisture it is necessary to keep it under ground. Is not that necessary?

Prof. Beach: Yes.

Mr. Richardson: It does not take much to wash out the land when we have violent rains, and when we have one of those rains it takes the dust mulch and the water along with it. There are men here that have been very successful in orcharding for years by using hog cultivation. If the land was left alone it was all right, but when there came one of those violent rains it washed the soil away clear down to the subsoil. In southern Minnesota our soil has clay subsoil, and it dries up in little pellets so you can shovel it out almost with a scoop shovel, and when our soil is in that condition, and we do not get any rain until quite late, the result is our crops have no moisture to draw on and are seriously injured. Now these men here say we should cultivate when there is no rain and in that way keep the moisture in the soil. Apple roots go down deep and the moisture will go down there. A few years ago I had occasion to read a paper before this society on my plum orchard in sod, and the members of the society rather criticised me on that account, and they called a man in here and asked him about two orchards. One was thoroughly cultivated and nearly dead with blight, and the other was a success and bore lots of apples, but was not cultivated. Mr. Underwood was discussing the same subject, and he advocated thorough cultivation. Mr. Brackett got up, and they had quite a discussion on trees, and Brackett said if they did not have grass in their orchards they could not raise any apples. A few years ago we had a paper read before our society by a man from Lake Minnetonka, a man who had lived there for years and years, and had had an experience of fifty years in orcharding. He had grown three orchards, he had cultivated, he had grown the trees in sod, and his experience covered a period of fifty years. The result was that he had no orchard. There are men here who have orchards who have got to cultivate if they expect to get anything from them, and there are other men who if they did cultivate their orchards would not get anything. The location has a great deal, and you might say almost everything, to do with it.

Prof. Beach: I do not believe any person can answer all these questions to suit each individual grower. Each grower must try to work out the principles of orcharding according to his own soil and apply them according to the knowledge he has obtained. I do not believe that any man can give directions for handling particular orchards under all conditions. I wish to say just one more word about the influence of moisture on fruit, and that is that in the experiment I

Digitized by Google

have described the difference was seen both in the amount of fruit and in the size of fruit borne by the trees. There was practically a less number of fruits per tree or per bushel on the tilled land than there was on the sod land. The sod land had the larger number of apples per barrel or per box, but a smaller number of bushels and less value.

This past summer we had a practical demonstration of the value of tillage for the orchard in a dry season. We had one plat of tough old sod, and one plat that we kept disced. On the cultivated plat even during the driest part of the season we could dig down two or three inches through the dust mulch and the earth was moist enough so you could make it into a ball, and it would stay in that shape. The total precipitation during June, July and August was several inches below normal. We had practically semi-arid conditions. The trees in sod lost a good deal of foliage during August and even up to October, while those that were on tilled ground held their leaves all through the season. When it came time to put in a cover crop in the tilled ground in August we fitted the land, disced it and then drilled in the winter vetch and buckwheat seed. It came up very quickly and was three or four inches high when the rains came. Thus we had a splendid growth of the cover crop in the orchard during the fall, and now it is in the best possible condition to stand the winter and catch the snow for winter protection.

Mr. Yanish: Have you observed whether trees of the same variety planted in blocks by themselves bear as well as where different varieties are planted together?

Prof. Beach: Sometimes they do not.

Mr. Yanish: I have in mind an orchard that I visited where Wealthys were planted ten years ago last spring and have borne hardly any apples during that time, but this season those that were planted next to other apple trees were loaded, while the balance of the orchard had only a few scattering apples.

Prof. Beach: It would be well to have no more than four rows of one kind together. After every four rows you can change the variety and may thus assist the cross-pollination in such a way that it will probably make a good deal of difference in some cases.

Prof. J. G. Moore (Wis.): The amount of moisture in the soil may appear to be greater sometimes than it really is. In northern Wisconsin we have our mulch two or three inches deep, and by taking the mulch aside the ground under it seemed to be moist. Just across the drive we had a plat under cultivation exactly the same soil and also growing small fruit. To demonstrate the relative amount of moisture on each plat we made some experiments, and it was apparently more moist under the mulch than it was under cultivated ground, but we found the plat under cultivation contained more moisture than the one under mulch, although to a simple observer without a demonstration the condition would have appeared different. Being sure the man who made the demonstration was wrong, we had a second demonstration made of the same plat, and we found out that the first demonstration was entirely correct.

Digitized by Google

Sorting and Packing Apples.

C. E. SNYDER, ORCHARDIST, PRESTON.

The barrel is the package we generally use in Fillmore County to market our apples in. We think that we can get more good apples for the money to the people who need them in barrels than we can in bushel boxes, bushel baskets, bulk or in any other way. Then a barrelful of apples is a convenient package to handle, considering the quantity, and with a little practice can be handled with dexterity and ease. We could put up very fancy boxes of Wealthy, Fameuse, Russett, etc., but not half the apples on the trees would run fancy, and then the balance are so run down in grade that they would not be No. 1 for barreling, and lower grades are not worth the barrels and freight. In bushel baskets the quantity is too small for the trouble. In bulking apples they are handled and jostled so much that the vivid color and freshness have left them after being shipped.

Apples should always be barreled in the orchard, and if put up right will look just as nice and fresh at the end of the journey as when taken from the trees. If hauled to town loose or in sacks and then packed in barrels in a warehouse, they are handled and jostled too much, no matter how much care is used, and are really not much better than if shipped in bulk. You cannot get your apples to the market in their best condition nor get the best results that way.

Every man who has over five barrels of surplus apples should have a barrel header. Any person can put up a good barrel of apples after they once see a packer pack and head a barrel—and I think you can without seeing it done after I tell you how we do it. We use New York headers, made by Sweet & Co., of Medina, N. Y. They make both the lever and screw headers. The screw header is preferred as it brings the head down steadily and even.

In packing an orchard of a hundred barrels or more we have a man take a team and wagon, with a basket rack on, and take out a load of empties, which will be fifty or sixty, and unload them in a convenient place in the orchard. If there is no sorting table in the orchard, we soon rig one up. Take an old door or wood-rack or nail four or five foot-wide boards eight feet long together, then nail a four-inch strip around it, then set it on a couple of empty apple barrels and spread a blanket or two over it, and you have a nice sorting table and a place for the pickers to pour the apples, and it will hold several barrels. Two men should do the packing and keep ten or fifteen pickers going. One man nails the hoops on the empty barrels and sorts the apples over the table, and the other faces the barrels and heads them when full.

Digitized by Google

When we get barrels the hoops are not nailed, and both ends are in. Pick out the best end, with the fewest boards, and leave it to use last. Take the other end, use three or four nails, 4-penny, and drive them through the outside hoop and slant the nail down so it catches the head. We use liners that come with the barrels on that end, which is the top when finished. If you don't use them, use more nails. It is not necessary to nail the next hoop. The two middle hoops put a short brad nail in each one on each side. Then turn your barrel upside down, loosen the two top hoops, knock in the head and lay it beside the barrel it came out of; then drive the hoops back to position. Now the barrel is ready to face.

People expect to see as good apples in the face as there are in the barrel, and if the facers are not good they will think there are no good apples in the barrel; so a packer uses the best representative apples to face with. It is the custom and people expect it. Lay a row around the circle inside, stems down, then another row and so on until the bottom, which is the top when finished, is covered. Then fill up with the apples sorted over the table, gently shaking the barrel occasionally, so the apples will settle themselves. No apples that fall on the ground should be put in, as the bruise will rot in a few days as the apples go through the sweat. Small and gnarly ones should be left out as they make the whole barrel look bad, and besides they do not fill up any as they settle between the large apples. They add to the weight but not to the bulk. In fact nothing but sound apples should be used.

Fill the barrel a little heaping, then hook the legs of the header on the bottom of the barrel and bring the press over the top. Lay the head taken out in position under the press. Then loosen the two hoops again, leaving the top one hanging to the side as far as you can push it, keeping it under the header and the second one just even with the rim of the barrel. Then turn the screw, dextrously tapping the head and driving the hoop as the head goes down, using a light hatchet. When the head is in place put on the other hoop and drive it to place; then take off the header and drive in some nails, like in the beginning. Right then turn the barrel upside down and put the name on it. Some use stencils, but a lead pencil will do. If you have occasion to open a barrel, you won't know your own apples.

In picking apples a good plan is to pick around the tree all the apples you can reach from the ground; then put a short plank on a couple of empty barrels, get on this and pick all around as far as you can reach; you will be surprised to see how nearly the tree is picked; then use ladders for the balance. In this way very few apples are knocked off, and not much injury is done the tree. When you start a

Digitized by Google

tree finish it, except little green apples may be left; they get a little better after the others are off but never make No. 1 apples. No. 2 and lower grades should be ground up for cider or vinegar or can be fed to stock. Horses, cattle, sheep and hogs eat them readily.

Half-bushel baskets with swivel handles over the top are good receptacles to pick and sort apples into, as they can be put down into the barrel and emptied out without dropping the apples. Tinware should not be used unless lined with heavy cloth. Picking in sacks of any kind lets the apples roll around too much, and the whole aim with our apples is to move them just as few times as possible. All apples have their season and should be marketed and used in that season. For instance, if Duchess are kept in cold storage, we would not like them in the Wealthy season. The Wealthy and Fameuse are very good till about Christmas; after that we would rather have Spy, Baldwin, Russet or Talman Sweet.

One thing about the great bulk of apples we raise here is to pick them just before they are entirely ripe, and it should be done quickly and marketed quickly. There is a sharp demand for all our fall apples then when not much fruit of any kind is on the market. That is the time to get there. In shipping 40 carloads of Wealthy, Pattens Greening, Okabena, Peerless, Hibernal, McMahon, etc., I should want *them* all on the market in ten days. Some years the price is not so high as others, but they want them, and they want them all over the country, *just then.*

Uses of Apples That Are Not Marketable.

EMIL SAHLER, WASECA.

There are many ways of making use of apples so as to make them bring from sixty cents to $1.25 a bushel. Many apples do not keep; such apples are not salable. They must be either thrown away or fed to the hogs. Instead of throwing them away they could be dried. Dried apples, if dried properly, will keep for many years. Here is the proper way to dry them: First of all you must remove the decayed spots; then you peel them and remove the core; next cut them into small pieces and put them in baking pans; place the pans in the oven and gradually dry the apples. Do not bake them, but have the oven just hot enough to dry them thoroughly. They must be stirred several times while drying. After they are thoroughly dried put them in sacks and hang them in a dry room. They are now ready for use at any time. These dried apples make an extremely good sauce. I am sure if you tried it once you would like it very much.

There is another way to make use of the unmarketable apples, and that is to make sweet cider or vinegar out of them. Great care must

Digitized by Google

be taken when making the cider that no decayed part of the apples gets in, for if it does it will spoil the taste of the cider. I make my cider with a Buckeye cider mill. After I press out the juice I strain it. I then put it in jugs, for it keeps much better in them than it does in wooden vessels. Whenever I go to market I always take a couple of jugs with me so that the people can sample it. The majority of the people always buy, and in this way I make a good profit and am most always sure of a re-order.

There is still another way in which the unsalable apples can be used and that is by making apple sauce, jelly, pie, preserves, butter and pudding. By these examples you can readily see that there are many different ways in which the unsalable apples can be made profitable to the owner.

Mr. Ludlow: Mr. Sahler, speaking in regard to raising apples and marketing them, said that this year we had a big crop and next year we would not expect any. So far as my experience is concerned I have solved the problem by which I get a crop of apples every year. It is simply feeding the trees at the right time. You must make a business of feeding your trees, and not anticipate a large crop one year and not any the next year. Now last winter after the ground was frozen hard I hauled out manure from the barn and put a big load around each one of my trees. That is not on the new orchard, but it is on the old orchard, and my old orchard has not been under cultivation for twenty-eight years. I put a big load against the tree and cover the ground so thickly that it will smother out any blue grass that may be there. In the spring when the rains come and the frost goes out of the ground the substance in that manure reaches down and feeds those little fibrous roots, and that helps the big crop which is to come this next year. Now

Emil Sahler and pruning implements beside a seven year old Col. blue spruce.

Digitized by Google

there is a proper time to feed the apple trees, and that is the time when the apple tree is exhausted more than at any other time, and you must feed your trees near the season when you gather your fruit. There is a certain time when the tree has got to make its fruit buds for the next year. After that it does not set any fruit buds until the following year, and then it sets fruit buds again. Now, if I want to get the greatest benefit and the necessary results from that manure in feeding those trees I turn in about sixty hogs, and they turn over the manure so thoroughly that no insect escapes, and the earth is rooted up and that manure becomes incorporated with the soil, and it reaches those fibrous roots and that helps to set fruit buds for next spring, and as a consequence I have fruit when my neighbors have none. Any way, that is my theory, and it works out finely and satisfactorily with me. My trees are just full of fruit buds for next year. Mr. Sahler says that next year we are not going to have any fruit, but I am going to tell you that I am coming up here to say that I had a bigger crop of fruit than I had this year.

Mr. Underwood: I do not like to have this subject passed by. I want to say this, that Mr. George D. Powell, whom I have spoken of as being one of the foremost horticulturists in New York state, has a large farm and fruit plantation and is most successful in disposing of his by-products. I visited his place, and I am sure that I received a great deal of information while there. He does not lose anything of the product of his orchard. Everything that he grows in the way of fruit is sold in a certain form, and he exports a great deal of fruit, pears, apples and things of that sort, and everything which is not salable as marketable fruit passes through an evaporator. I have an idea that this is the medium by which we can take care of our fruit. Briefly and quickly described, he has a building which has two stories. In the lower story he has two rooms, where there is a large stove, and up overhead the ceiling is made of wooden slats. In these two rooms he does the evaporating of the fruit. In another adjoining room he has the machinery necessary to prepare the fruit. He has machinery for paring and coring apples, slicing machines and everything necessary to prepare the fruit for the evaporator, and everything is picked up, nothing goes to waste. There is a place where the pits and the skins and the cores of the fruit are put, and this waste or by-product is all gathered and packed very carefully and marketed, and he finds a market for everything. Of course, I cannot give you the details because I am not prepared to do it, but if anybody knows anything about evaporating apples I would like to hear from him, because I want to put an evaporator in our place next year to take care of our fruit, because there are so many apples we do not want to put on the market. They tell us to select our fruit and market only the biggest and the best, but what are you going to do with the rest? Five per cent. of your apples are such that you do not want to put them on the market, and there is no other way in which you can dispose of them.

Mr. Kellogg (Wis.): In western New York they do a great deal of evaporating, and they take good care of the cores and skins; they put them in sacks, and those cores and skins are sent to us as wine. You can get rich on anything if you put it up in the right shape.

Digitized by Google

The Vegetable Garden.

A "QUESTION AND ANSWER" EXERCISE CONDUCTED AT ANNUAL MEETING BY H. J. BALDWIN, VEGETABLE GARDENER, NORTHFIELD.

Mr. H. J. Baldwin: I was interested during the latter part of the summer season in a statement that came out in some paper relative to the product that came from the market gardeners in Minneapolis and surrounding counties. If you were to figure up the apple crop this year, as much as we appreciate that fruit and as high a price as it sells for, you would find that the vegetable crop of our country as a whole, and in the states, especially in the localities near the Twin Cities, where the output of garden products would surprise you, you would find that the apple crop was not in it for a moment with the vegetable crop. Think for a moment how important the vegetable crop is! Last season, when there was hardly an apple, and the price was almost prohibitive, there were thousands of loads of vegetable brought into town and sold. The crop was not only very valuable, but it is something that everybody has to have. In many families the apple is a luxury which they cannot afford to buy. The vegetable product of various kinds is something that every family must have.

It might be fitting to say right here a word or two relative to the starting of a vegetable garden in summer. I suppose I am speaking to a majority of people who are not professional market gardeners, but are probably running a garden in connection with their farm work—that is the majority of them. I take it that anybody who does not know how to start a hotbed successfully is very much handicapped in getting a start at all in growing vegetables. It is very important to know how to run a hotbed, and those who do not know should learn. I have found that nothing compares with cement construction for the foundation for a hotbed. That is all right for any man who has gumption, and can put it in without any hired help. Mine are put in that way, and if any of you wish to ask any questions about cement hotbed frame I shall be glad to answer them.

Mr. Peterson: How thick do you make the walls of your frame?

Mr. Baldwin: I find six inches is sufficient. You want to dig a trench for your frame just big enough to fill up with grout, and put in all the old stones you have, brick, old iron, or anything of that kind, and if you have any old pipe to bind the cement together it will work very well. Fill it up all around, fill it to the surface, and then you have to put up some boards, between which you fill in cement. You want to make the upper side just about six inches higher than you do the lower side, in order to give the sash the proper slope. As to the depth of a hotbed, that depends considerably on what time you want to start it. You need to make it considerably deeper if you want to

Digitized by Google

start your hotbed in March than if you start it in April or later. You can readily gauge that depth. If you put it in the last part of February or the first part of March, three feet is plenty, and if you do not care to start it till the 1st of April, probably eight to ten inches shallower would do. Make your frame so that the sash will lap over a little. I use six foot sash, and my sash covers the frame nicely. I make my beds twenty-four feet long. It might be a few inches shorter, and eight foot sash makes it tight and warm. After I get the dirt and fine manure mixed I cover with leaves or coarse manure, and then I can start the bed at any time. I can start any day in winter as far as the loam is concerned. One end has nothing in it, and in the other end we have the dirt. You start and put in hothouse manure one-half way and tramp solid, then throw onto this all the loam. Proceed to fill the other half with manure, and then you need throw only half of the dirt back onto this. Then you can put on your sash, and you are ready to go to work. You have to provide also wooden shutters to protect from snow.

H. J. Baldwin, Northfield.

Mr. J. O. Wells: How do you fix it so the wind will not blow off the sash?

Mr. Baldwin: Unless the wind is perfectly terrific I have never had any trouble that way. Once in a while you have to weight them down if you happen to open them up on a warm day.

Mr. Martin: Do you have any trouble with sash getting tight?

Mr. Baldwin: No, not particularly, but a good many times I have had them fit so tight that I had to pry the sash off. As soon as it is shut up at night I put the shutters on top, and we have no trouble at all. I had rather have a hotbed too cold than too hot.

Mr. Husser: Would you sow plants of a different nature, such as cabbage, tomatoes and other vegetable seed, in the same hotbed?

Mr. Baldwin: I am glad you asked that question. You will find that a hotbed needs to be made up for different plants. I make up a bed for radishes, another one for lettuce and so on for the different vegetables. We grow radishes for the roots, and we do not want the top. Lettuce you grow for the top, and you don't care anything about the roots, and you want the top to get as big as it can. You have to have more air space for lettuce and not so much for radishes. Then also different plants need different temperatures. For instance, you start tomato plants in the hotbed and they need a great deal of sun, they want a warm temperature, while on the other hand celery needs

Digitized by Google

a lower temperature. It makes a big difference whether you start your plants right as to how they grow in the future. In starting plants real early, where you are limited as to space you can start them almost anywhere, and they are on almost equal conditions until they get out of the ground, and then you can commence to transplant and put them into situations where the temperature is proper for each kind of plant. After they have made a growth so that they can be transplanted, we usually at that time of the year have less of cold weather to contend with. Cabbage I start quite early, and the early cabbage is hardly more than out of the ground until I begin to plant them singly. Cabbages need a cool place in which to grow.

Mr. Johnson: Do you make your beds solid all the way through, or do you put divisions in every six feet in the frame?

Mr. Baldwin: I run my bed continuously twenty-four feet, and that gives me room enough when I take off the sash so that I can take off four on one side and four on another. Some lift a six-foot sash, but I have an iron, a kind of a hook, that I can stand on the lower side and by giving it a pull can raise up the sash. You can do that very quickly. I can uncover seventy-five to eighty sash in about ten minutes in that way. I like to leave them open when the weather is in proper condition and give them as much air as I can.

Mr. Busse: What have you to say about the stem rot in cabbage?

Mr. Baldwin: I have learned a few things about that. I raise the Holland cabbage, and that is a cabbage that you have to keep off of low ground. You don't want to put them on low, black soil, but put them on higher ground. One cause of that trouble is that the plants are put too close together. You are apt to plant them close together and try to grow as many as you can on a given piece of ground. Keep them so the sun can get at the stems, and you will find that stem-rot will be largely eliminated. Somebody puts in this question: "Which way for a fellow to raise cabbage seed?" I have not had any experience in growing cabbage seed. It is one of those plants that is very readily raised in any locality. Most gardeners get their seed from the old country. Some of the native grown seed is very good. That raised on Long Island and places along there is very good. I do not raise my own seed.

Mr. Gordon: The seed can be raised well enough, but the question is whether the seed is strong enough, whether it has vitality enough, I want to ask whether we can raise a cabbage plant this year and put it in the cellar with the root and raise seed from it the next.

Mr. Baldwin: Oh, yes, that can be done very readily. Cauliflower seed is grown in that way—that seed is raised almost entirely in the old country.

Mr. Anderson: Do you transplant cabbage and tomato plants?

Mr. Baldwin: I do. The transplanted ones are better in every way. To some people it seems like a very great burden to transplant plants. People come along and say to me, "Did you transplant all those five hundred plants?" I tell them, yes of course, and I laugh at them. It is no great job to set from three to five hundred plants, I can set them in two to three hours. I make a specialty of tomato plants, and I enjoy the growing of them. I sell the farmers perhaps seventy-five

Digitized by Google

dollars' worth of plants per year. They are transplanted three times, and the farmers get a good deal of enjoyment out of those plants because they are strong and stocky and well rooted. Some have buds on and some even blossoms, so they continue to grow right along. I would not sell them unless they were transplanted.

Mr. Glidden (S. D.): I am from South Dakota and it is very dry there, and it is almost impossible to do this transplanting unless we have an especially favorable season. For the general crop I mark off my ground with a cornplanter, then I drill the seed in in the cornplanter marks. I then give it a little cultivation with a hand cultivator, and when the plants are a few inches high I hoe the weeds out of the cabbage and tomatoes, and I find in that way I get a good deal better stand than I have ever been able to get by the method of planting and then transplanting.

Mr. Ludlow: I want to take a hand against the seed catalogs which usually say that tomatoes must be planted on poor soil. I believe tomatoes planted on rich soil will do a great deal better than if planted on poor soil. They can be treated in such a way that they will give twice the return on rich soil that they do on poor. If the tops are cut off, the substance will all go into the fruit. Of course, we understand that when tomatoes are planted on rich ground there will be very dense foliage, they grow very rapidly, and the foliage will grow at the expense of the fruit, but if they are properly trimmed the fruit will be developed more than the foliage, and I believe in that way we have better success with tomatoes on rich ground than we can on poor. You get larger fruit, it is colored up better and it is better in every way. For instance, I planted the Ponderosa tomato. I trellished them up on a wire trellis, trimmed them up to one vine, and I had as fine fruit as can be seen anywhere in this country. The fruit was large and round and perfect. After I got them all tied up on the trellis I trimmed them so that the fruit had a chance to develop instead of the foliage.

Mr. Baldwin: That may do with certain varieties of tomatoes. Now you take the Earliana, that never grows much foliage, and you cannot treat it in the way you treat the Ponderosa. Perhaps by using a little more ashes and not so much nitrogen it will keep the plant from growing so much foliage, and will do better in the way of fruit. I believe you ought to be careful in trimming tomatoes not to trim too severely. The fruit commences to form at the bottom of the plant, and if you cut the top off you destroy the chance of getting more fruit after the fruit in the lower part of stem has ripened, and you will find that in a short time your plant will be without foliage. Some kinds need severe trimming, like the Ponderosa, but ordinarily if you cut off the laterals and then trim off the top it will not be long before you have a bare vine.

Mr. Glidden: What do you consider the best early tomato?

Mr. Baldwin: Perhaps the Earliana is the best type we have of the extra early tomato. The season can be very much prolonged by planting at different times. If you will sow your seed at different times so that you can keep up a succession of plants you can prolong

Digitized by Google

the fruiting season until a very late period. It is also true that the fruit from those later grown plants is much nicer and finer in every way than from the plants that are set early and are kept fruiting during the season. We plan to have fresh tomatoes on the table four months during the season, and I think if the proper attention is given anybody can do that.

Mr. Baker: I can hardly see the sense in allowing a tomato vine to grow ten to twelve feet long. If you trim off some of that vine you will certainly have earlier fruit. If you will cut off the top you will certainly get better fruit, and there will not be a whole lot of little green ones to throw away at the end of the season.

Mr. Howard: What is the best kind of a seeder for all kinds of seeds?

Mr. Baldwin: I think the Planet, Jr., is a good one, but then there are others, too, like the Iron Age and others, but I use the Planet, Jr. There is a great deal of satisfaction in using a seeder if one knows how to use the machine.

Now I would like to spend just a few moments on the potato. I have seen accounts and heard remarks about crops of potatoes, specimens of which weighed four pounds apiece. They were probably grown like those of a man about whom I heard a story. This fellow, it seems, was up against the dry weather and found that his potatoes would not grow. He tried to water them, but that did not work; it did not rain, and so he found himself up against it. He finally hit upon the happy scheme of planting an onion in every hill of potatoes and the onion made the eyes of the potatoes water and he had plenty of moisture and secured a good crop.

Mr. Carlson: What do you consider the best early variety of potatoes?

Mr. Baldwin: If you go to the market here in Minneapolis you may expect to find nine loads out of every ten of Early Ohio. I think there is no potato so near the standard as the Early Ohio. There are some early ones on the market that are not fit to eat, however, like the Bliss Triumph.

Mr. Sampson: How about the Early Rose?

Mr. Baldwin: That is quite an early potato, but it scabs easily and for that reason it is not so desirable as the Early Ohio. However, in localities where the Rose does well and is not scabbed so much, I think it would be a very valuable variety to plant. The soil for early potatoes must have different treatment than that for late potatoes. An early potato ought to grow in eleven weeks, and it stands to reason that a potato that grows in eleven weeks ought to be differently treated from that which takes eighteen weeks to grow. You have to prepare the soil in a different way for an eleven weeks' potato than for an eighteen weeks' potato. In my soil I do not want any fresh fertilizer for late potatoes, but if I can manure the soil the year before and put no manure on the year the potatoes are planted I can get a great deal better potato than I could if I had put on fresh manure. By using horse manure you can raise early potatoes that are not scabby, but with cow manure you get scabby potatoes.

Digitized by Google

Mr. Pierce: Is the Early Ohio a good eating potato?

Mr. Baldwin: It is one of the best potatoes grown.

Mr. Pierce: Are they not hollow-hearted?

Mr. Baldwin: No; not unless they are grown over-large.

Mr. Anderson: Do timothy and clover make good potato ground?

Mr. Baldwin: Yes; there is nothing better than clover ground.

Mr. George: Is there not danger of manuring too heavily and getting scab on the potatoes?

Mr. Baldwin: I am doing just gardening work, and my soil is fertilized very highly, and I think it should be much worse for scab than other soils. Anybody who knows anything about potato growing knows or ought to know that there is no need of having scabby potatoes on the place. He can treat the seed with corrosive sublimate or formaldehyde.

Mr. Barnes: Would you raise potatoes on ground two years in succession?

Mr. Baldwin: Oh, no; it would be foolish to try to raise them on the same ground year after year.

Mr. Johnson: Is the Carmen No. 3 a good potato?

Mr. Baldwin: That is a very good potato indeed, and another that is about equally good is the Rural New Yorker. The best crop I saw around Northfield were Carmen No. 3.

Mr. Jones: Are they not liable to get hollow?

Mr. Baldwin: Yes; there is just the same trouble there is with any large potato. Don't put too much fertilizer on the ground and don't expect to get too big a crop. It is better to have medium potatoes and not so many than it is to have too large ones and a big yield.

Mr. Darling: Could you not reduce the size of the potato by planting thicker?

Mr. Baldwin: I had an experiment one year when seed was plenty and I had Early Ohios, very large and smooth. I put a barrel in two or three rows, twenty rods long, and those potatoes produced about five times as many little ones, which I had to throw out, as the rows planted with potatoes cut in the usual way. That is a great trouble in planting potatoes too thickly, there are so many that grow small and are not fit for the market and have to be fed or thrown away. You would better have potatoes that are large and salable and good to eat than to raise so many.

Mr. Ordway: This year I had about two hundred bushels of potatoes on sod broken the year prior. Two years ago our crop of potatoes was the largest on low land. A pure peat was not as good as mixed soil. There was a tendency of the potato to turn a pink color inside.

Mr. Dooley: We had last year a brown potato bug, and I would like to know whether anyone else was troubled with that bug.

Mr. Ludlow: Back in Ohio, when I was a boy about fifteen or sixteen years old, we had a regular siege one season of those bugs and they went over the whole territory. We took some straw and strung it out lightly along the rows and set fire to it, and we never saw any more of those bugs. (Laughter.)

Digitized by Google

Mr. Baldwin: Yes; today they are here, and the next day they are gone, and probably they will not return for many years and perhaps not at all. Sometimes you will find a few around the house on asters or something of that sort.

Mr. Carlson: They do not like airslaked lime either.

Mr. Baldwin: I don't think they are a pest like the old-fashioned potato bug. The old-fashioned squash bug when it first came out was one of the worst pests we ever had. If you ever squeezed one in your finger you would never do it again, because it smelled worse than a skunk. I used to lay awake nights to think how to save the squashes from these bugs. One night I thought out a scheme that I put into practice, and I think I succeeded. This is the scheme I hit upon: I observed that one weak point about those squash bugs was the fact that they would all come home to roost every night, and there would be thousands in the morning in a place about a yard square. I had twelve to fifteen colonies in my patch. I bought myself one of these blow torches like electricians and tinners use, and I went out there early in the morning with that blow torch and I think in two hours' time I had killed about ninety-eight per cent. of those bugs. I thought the neighbors would want to borrow my blow torch, so I went over to my neighbors and wiped the bugs out of their patches, too.

Mr. Glidden (S. D.): I have been able to get rid of bugs by using air-slaked lime. Take an old thin gunnysack and fill it with lime and then shake it over the wine, and you will find after several applications of that treatment you will not be troubled any more with bugs.

Summer Pruning. Pinching, or stopping, is a method of summer pruning whereby robust shoots are checked at any desired height by removing their extreme points with a pinch between the finger and thumb. This process retards for a time the extension of such shoots and induces the more active growth of laterals. For the control of some plant diseases pruning is effective. Fire blight of apple trees may be controlled by cutting out diseased branches and cannot be done in any other way.

Judicious pruning facilitates the work of cultivation and spraying and determines to a large extent the fruiting habit of the tree, by making annual bearers of trees which formerly bore once in two years. The grower has everything to gain and nothing to lose, yet he should become acquainted with the habit of growth of different varieties, so that he may work more intelligently. The upright varieties may be spread somewhat by pruning to the outside laterals, and the spreading kinds may be contracted by cutting to those which have an inward direction.

In the production of fancy fruit, thinning pays, and pays well. It means much in the assurance of crops of only higher-class fruit. It is not likely to be of value unless the orchard is right in the matters of variety, fertility, cultivation, pruning, and spraying; it is not likely to give good returns unless the high-class article produced is properly packed and marketed by business-like methods. Thinning is an essential feature of the new orchard culture.

Digitized by Google

Outside Storage Cellars.

F. L. MARSH, ARCHITECT, CHAMPLIN.

My first experience was with a cellar which I built on my own farm. The soil was stiff clay, and sloped to the east. I excavated to exact size and plastered sides and floor with cement mortar, same as a cistern. This stood some years, but one winter while I was away and the cellar empty, some one left the door open, and frost scaled off the cement. The first cover was rafters, boards and earth. This leaked badly and rotted out in three years. Then I put on oak joists, plastering on top of the joists with cement, and below with lime mortar, building a cheap shingled roof above to keep the rain off, with sawdust below it. I put in wooden stairs, two inner doors, and a drop door on the outside. All these methods, like other cheap makeshifts, were in the end unsatisfactory. An outside cellar may be very lasting if we study durability and eliminate wood as far as possible. I tired of shoveling the snow off the trap door after storms or wind.

F. L. Marsh.

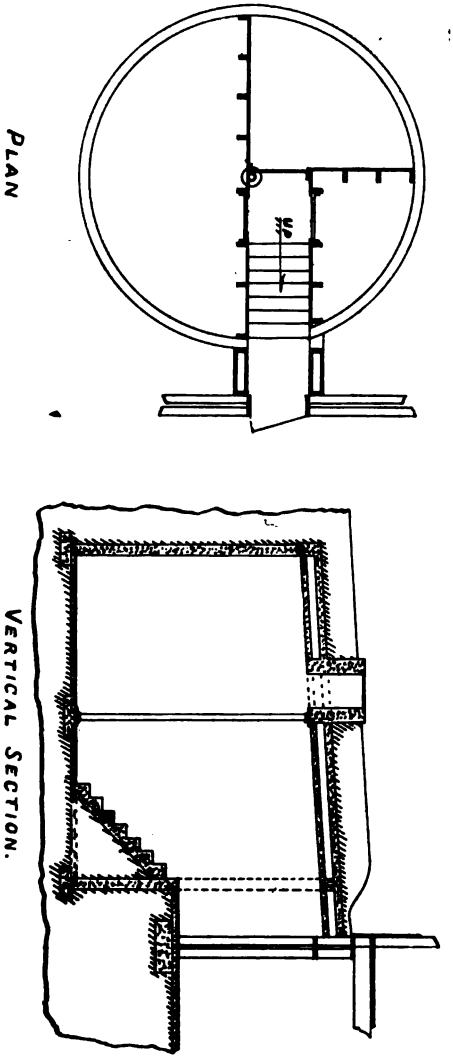
However, my experience with this cellar convinced me of their great value, and that it pays to build them right. Potatoes and roots of all kinds kept perfectly and were as plump and crisp in the spring as when first put in. It was too damp for onions, and cabbage moulded, but I did not build it quite warm enough to bear a sufficient amount of ventilation. I had no fruit then, so did not test it for that purpose. When cleared of vegetables, it was ideal for dairy products in hot weather.

Durable Construction. Now why not build the cellar right, and instead of having to figure from twenty to thirty-three per cent on the cost for deterioration, so build it that one or two per cent will pay for deterioration and repairs—to say nothing of avoiding loss of the contents by possible collapse of a cheap structure? Fifty years should be the minimum life of such a cellar, the maximum I will not try to predict.

Digitized by Google

The Material. Cement grout is usually the best material, reinforcing for top and some of the angles, but in localities where suitable sand and aggregate cannot be had, other material may be advisable. In any case we should not lose sight of the fact that air is the only building material that can insulate against Minnesota's cold weather. Hollow brick have strong points in this direction.

The Location. Sloping ground is better than level, as it gives a more convenient entrance and easier drainage. A south or east slope is preferable. Avoid a west, and especially a north, slope; though for fruit storage, where a low and uniform temperature is a chief requirement, a north slope may be best if well sheltered from the wind. Low ground is to be avoided, especially in retentive soil.



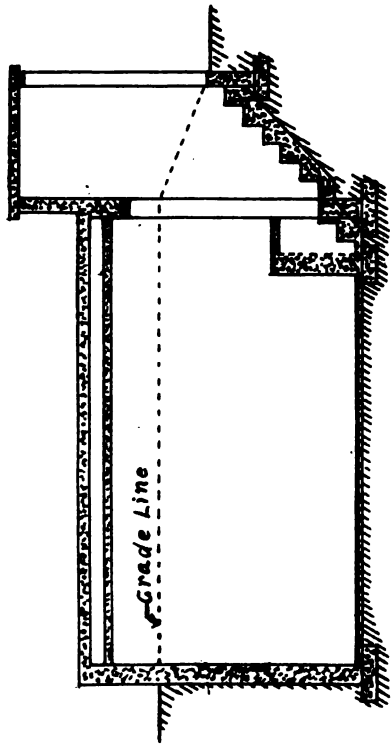
PLAN

ROUND ROOT CELLAR, ATTACHED TO BARN.

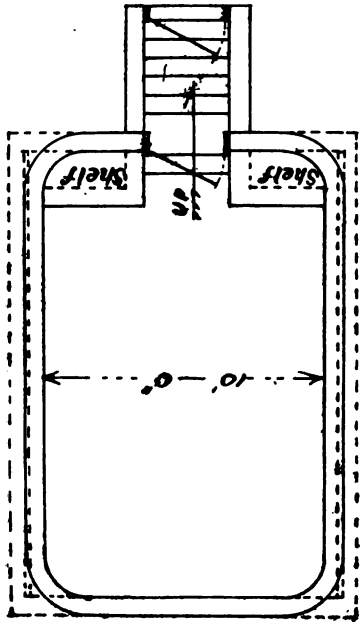
VERTICAL SECTION.

Control of Temperature. The construction must be warm. That gives opportunity for more ventilation without danger from frost. Cold tends to work down; hence the top should be double. Earth above the arch is still safer. Air movement is less a matter of purification than of temperature control. However, there is no new problem; only the old precaution, so often neglected, of so placing the flues that the air cannot help going through them in the proper direction. Isn't it asking too much of air to expect it will move through a tube just because we want it to, when we have so placed the tube as to give a backward tendency or none at all? Glazed tiling makes good flues. The intake should be in a cold place, so the heavy, cold air will fall in

Digitized by Google



VERTICAL LONGWAY SECTION.



FLOOR PLAN.

ROOT OR FRUIT CELLAR FOR LEVEL GROUND.

through it. If practicable it should be discharged near the top of the room, with a baffle plate below to scatter it as it falls. Do not open the discharge under a bin. The outlet flues should start near the floor, and run up in the warmest location possible. The size of each should be ample, with dampers to control the amount of air passing.

Lighting. Windows or swinging sash can be placed in gables or in all entrance ways. Use plenty, and protect by storm sash. Screens should be used in summer.

Drainage. If there is danger from surface water, a line of tile can be laid below the floor near each side, and also on the outside higher up, and a short distance away from the walls.

Rain. A leaky cellar is a nuisance. The cement cover should be waterproof, and shallow ditches should be constructed at the sides, leading to lower ground.

Relation to Other Buildings. The cellar should be carefully located as to other buildings, according to its chief use. Sometimes it is wise to place it below an above ground storage room

Digitized by Google

for such vegetables as onions. It may be placed below a workshop or other outbuilding. In these cases the floor forms the cover. If this room is cold the floor should be insulated by plaster ceiling or air cell goods; also midway between the joists and under the floor boards, securing two air spaces. Where used chiefly for roots it may to advantage be attached to a barn basement.

Handling the Contents. Bins or racks may be used, according to nature of contents. Racks should be up from the floor and as open as possible, for fruit especially. Stuff stored in barrels will need different arrangement. Careful laying out of bins or racks will add to the capacity and the ease of handling or watching. A level approach is preferable, as a truck or an overhead carrier can be used, saving much heavy labor. A carrier which can be raised can be used where there are a few steps. The tracks should pass through slots above the doors. Roots or potatoes may be dumped in through a manhole with double cover, arranged like one for a cistern.

The Cuts. On page 306 is shown a plan and vertical cross-section of a double cellar for fruit, with side-hill site to give a level approach. Racks are indicated. One part may be used for vegetables, the concrete division wall preventing odors from injuring the fruit. The upper arch is first constructed, leaving holes in it. Use wood arches and boards or plank for forms, and suitable reinforcement. When well set, drop the forms down, and construct the lower arch, working from each side toward the center, inserting the boards as needed. Finish through the holes in top arch, and then fill them. The lower arch needs less reinforcement. A row of columns of gas pipe and a reinforced rib in center will greatly strengthen the arches. Otherwise, the ground must be solid at the sides, to resist the side thrust.

Page 304 shows a smaller cellar with entrance in end. The main cellar has a double arch cover; the approach a flat slab of concrete. It will be seen that a more sloping site would allow the approach to be lower and require less steps.

Page 303 shows a round root cellar connected with a barn basement. It can be filled through the manhole, spouting to any bin. The cover consists of two flat slabs with air space, is pitched for drainage and covered with earth.

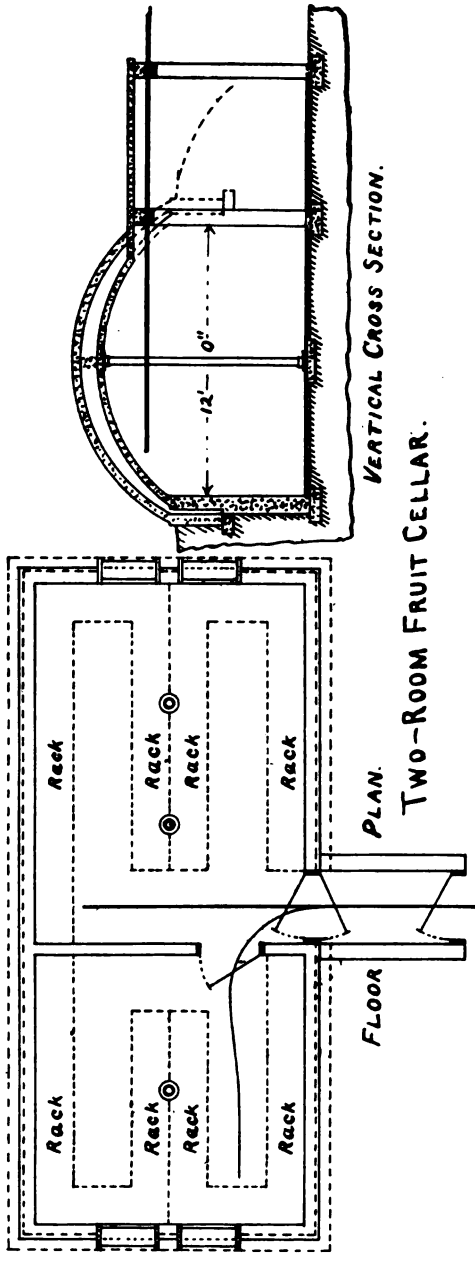
The necessary reinforcement should be carefully figured, not guessed at, for enough can be saved to pay several times the cost of figuring and maybe avoid a collapse. The round form is strongest and as handy for roots. Round corners shorten the side walls, and offer little obstruction to racks, and none to bins.

The suggestions here given are general rather than specific. They should, to get their full value, be carefully adapted to individual needs.

Digitized by Google

Mr. Sahler: What does it cost to put up such a building?

Mr. Marsh: That all depends upon the locality. Conditions vary in different localities.



Mr. Sahler: What would you use, four-one or three-one?

Mr. Marsh: I think that four-one would be amply rich, or five-one would be sufficiently rich.

Mr. Teigland: What is the thickness of the walls?

Mr. Marsh: That would depend on the soil. It is almost impossible to answer that question definitely.

Mr. Teigland: Would it be all right to have a concrete floor?

Mr. Marsh: Yes, it would be all right, but it would have to be a richer mixture.

Mr. Sahler: The arch is of cement?

Mr. Marsh: Yes, it is made of cement.

Mr. Sahler. How thick?

Mr. Marsh: Three or four inches. You can build it cheaply by using more reinforcement, especially where your concrete would be more costly. That reinforcement should be done, and you should not forget that. You can get any dealer or manufacturer who handles reinforcement to figure out just what you need.

Mr. Husser: What do you mean by reinforcement?

Mr. Marsh: Well, there are several kinds, I think what is called "expanded metal," so-called, is the cheapest. You can use rods such as you use in

Digitized by Google

concrete work also. In certain cases you can pick up old iron, or something of that kind, and it will answer the purpose very well.

Mr. Husser: Would you consider a root cellar that keeps roots well as a proper place for the storage of apples? It must be moist, but for apples it should not be so moist.

Mr. Marsh: You cannot hurt apples with moisture if you keep them cool enough. That is the reason I emphasize the fact that you should build warm so that you can have ample ventilation and not get the temperature too high.

Mr. A. W. Richardson: How much soil do you put on?

Mr. Marsh: I should say a couple of feet.

Mr. Richardson: Would manure or litter do to cover the top?

Mr. Marsh: I don't think that is necessary.

Mr. Byers: How much of an air space do you make?

Mr. Marsh: If you cover with earth you do not have to have so much.

Packing and Marketing Apples.

PROF. A. R. KOHLER, UNIVERSITY FARM, ST. PAUL.

An occasional visit to commission row reveals a variety of important circumstances concerning the present status of apple packing in Minnesota. Imagine, for instance, crab apples coming to a commission house in ordinary sacks; imagine the conception of any man as to what the requirements of proper packing are when he will ship fruit in such a manner. It goes without saying that, from a commercial standpoint, it is a most slovenly method of packing, that the fruit will invariably be badly bruised and that it will be greatly reduced in value. Consider for a moment to whom the commission men must look to buy fruit received in such a condition. Does such a grower realize that the commission man can sell fruit so packed only to peddlers? Does he realize that peddlers buy largely at their own price, which is anywhere from 50 per cent. down to 10 per cent.—and very often less than 25 per cent. —of what the real market value ought to be if the fruit had been properly picked, packed and marketed? Of course, the quantity of fruit shipped in sacks is relatively not large, and yet it is a surprising fact that every time I visited commission row up to early in November I found some of this very stuff there.

Another instance of very poor judgment in packing was observed when a considerable number of a peculiar shallow type of box, packed with apples, reached the market. The apples were originally about the finest Yellow Transparents that I ever saw from the standpoint of size and attractiveness of appearance, that is, before they were packed.

Digitized by Google

The boxes were about the depth of a western peach box and a little larger. Two layers of apples were packed in each box. The apples were a little too large for the depth of the box, with the result that they protruded a little above a level with the edge. The only protection on the top of these boxes was mosquito netting of a red color, which, besides being inadequate, somehow gave the package a very cheap appearance. The apples were considerably bruised. Being above a level with the edge of the box, and with practically no protection, it was inevitable that, as they were piled upon each other in the car, each box

Three and one-half, four, and four and one-half apple packs.

would rest directly upon the fruit in the box below, thereby bruising it, and that the fruit would again be similarly bruised when piled from the wagon onto the walk in front of the commission house. Also the grower must bruise the fruit in a similar manner in loading it onto his wagon and again in loading it into the car, or onto the platform at the freight depot, and, furthermore, the fruit would again be bruised in getting it moved from the commission house to the ultimate consumer. This fruit, which was originally very fine, was reduced in value at least 50 per cent., and perhaps more, as a result of improper packing.

Another factor to be considered in connection with this particular lot of fruit is that the type of package used, even though the fruit had reached the market in good condition, was not the kind of package in which the customers of the commission house want to get their apples. This alone makes it more difficult for the commission man to sell the fruit for what it is worth, with the result that it goes slower, and ulti-

Digitized by Google

mately a lower price must be accepted. I did not learn where the commission house sold the apples, but judge from the general appearances that this was in all probability another case where they went into the hands of a peddler and for a price that was probably 25 to 50 per cent. of what the fruit would have brought had it been properly packed in the right kind of a package.

Quite a bit of fruit comes on the market in bushel baskets. This, a commission man told me, is not so very bad a package, although he considered it more desirable to ship in barrels. If growers wait too long to buy their barrels, or do not have enough and cannot get them on short notice at the time of picking, the bushel basket is probably the best substitute available. When apples are packed in bushel baskets they should be well shaken down, without bruising, however, and filled up full enough so that some pressure will need to be applied to get the cover on, in order that the fruit may be held firmly in position and not moved about in the package, thereby becoming bruised during the handling and hauling necessary in reaching the commission house and ultimate consumer.

Orchard boxes, used in bringing fruit from the orchard. The cleats enable them to be hauled on top of one another.

One of the most common mistakes that is made is for the grower, who has a few barrels of apples to go down to the store and buy a lot of salt barrels to ship them in to the market. These salt barrels usually have an unattractive outward appearance and, besides this, have the serious fault of still containing some of the salt, which can never be completely removed. Commission men say that the salt has an undesirable effect on the fruit. The use of sugar barrels and second hand flour barrels is likewise to be condemned.

Another mistake sometimes made is packing the apples in soap boxes and other packages having an unpleasant flavor, which they impart to the contents of the package. The appearance of the soap boxes on the market is, of course, even more unattractive than salt barrels.

Digitized by Google

All such packages inevitably give the prospective purchaser the impression of slovenliness. They signify to the prospective purchaser the same slovenlinesss concerning the contents of the package that is noted concerning the package itself. Will he buy this stuff? Certainly not, unless he is a peddler or a huckster and can get it for a price far below the real value of the fruit. These men make their money out of it by removing it from the original package and putting it into bushel baskets or handling it in some other manner so as to give it a more attractive appearance. The first class groceryman will not buy such fruit because he does not like the looks of it. He does not want such a package standing around in his store. He cannot, or at least does not want to, go to the trouble of changing the fruit to other packages, and, furthermore, he is too much afraid of what the contents might be, a risk which is great enough even when good looking packages are used. You can readily see, therefore, that the commission merchant who has his trade—and wishes to keep his trade—cannot send out fruit packed in such a manner in response to telephone orders, or orders from outside points by letter or telegraph, by which means a considerable quantity of fruit is sold.

Too little bulge on apple box.

In a recent visit to Commission Row another very serious error was observed. A grower had placed a carload of Wealthys in cold storage because the price was a little low at the time, and he thought he could make more out of them by holding them until the greater share of the home supply had been consumed. His theory was good, for the price of apples went up over a dollar in a comparatively short time after the influx of home grown apples slackened up. However, when he came to examine his fruit, he found that a great deal of it had decayed and that he would have saved considerable money if he had sold the fruit immediately without placing it in cold storage. His theory

Too much bulge on apple box.

Digitized by Google

failed to work out in practice, not because the theory was faulty but because of improper picking and packing. When I visited commission row I was informed that men had been busy sorting over his carload, and that only 50 per cent. of it was good. I saw a sample barrel of the sorted product. It was quite green, shriveled and somewhat bruised. How he had originally packed his barrels I do not know, but this I do know, that he would have had a very large shrinkage regardless of how he packed them, for the reason that he picked the fruit too green to keep well and that in all probability he had not hand picked the fruit or if he did was not duly careful to see that it was not bruised and kept free from skin punctures, through which much rot enters. Fruit that is picked too green is likely to go down when in storage even worse than fruit that is allowed to become a little over-ripe. However, both of these extremes must be avoided. It is desirable from the standpoint of holding up in cold storage and having the maximum market value that the fruit be allowed to become as ripe as practicable without, however, allowing it to become over-ripe.

Furthermore, the fact that fruit picked in no matter what stage, if not carefully picked, well sorted and properly packed, can not be expected to keep in cold storage is worthy of again being called to your attention.

Another instance will illustrate another point: One grower, who produces a considerable quantity of fruit, sent to a commission house a consignment which reached the market in very bad condition. The fruit had settled all the way from a few inches to almost a foot, and as the barrels stood on the walk the juice ran out across the walk and on into the gutter. What was the trouble? What was the reason? Probably a combination of several reasons. Besides lack of care in picking and careless handling generally, together with improper packing, this fruit, which came in a little after the rush of Wealthys was over, had, in all probability, been kept in a grocery or some such place for a period of two or three weeks before it was shipped. Such a practice will not do. Fruit must be cooled as soon as possible after picking and be kept as cool as possible until it is shipped. If a cool place is not available on the farm the fruit must be shipped and sold for what it will bring at the time or placed in cold storage. Of course, the more carelessly it has been picked and handled the greater the need of prompt cooling, but in any case the importance of early cooling, and cold storage without delay if to be placed in storage, is great, as has been amply demonstrated by the work of experiment stations and the experience of many growers. The Wealthy, and most other Minnesota apples, are a rather perishable product, much more so than the varieties of the

Digitized by Google

larger commercial sections, and require careful management in order to hold them over successfully.

Some growers pay no attention to the proper facing and tailing of the barrels, and lose twenty-five to fifty cents each thereby. Many do not seem to have any conception of how to pack a barrel properly. Since most of the Minnesota apple crop will always be sold in barrels, it is, in general, more important that we should learn how to use this package properly than to try to learn how to pack in boxes.

Proper bulge on apple box.

Some of you may have been saying to yourselves while I was reciting the above instances, "He is hitting neighbor Brown, or Jones, or somebody else, a good whack, but these things do not apply to me." Perhaps the specific instances do not, but there is not a grower here but could and ought to improve his methods in some one or more important particulars.

A question which comes up in connection with the marketing of apples is whether to pack them in boxes or barrels. Most of the Minnesota product had best be packed in barrels. Our growers are, as a rule, not yet doing enough spraying or following other points in good orchard management closely enough to produce any considerable percentage of fruit that is of high enough grade to go into boxes. The box is essentially a fancy package. The contents of the box must grade much higher than barrel stuff. The fruit must be carefully sorted and graded as to size, color and freedom from blemishes for the box pack. Furthermore the whole pack must be honest and well put up. The life of the box as a market package depends on the ability of the grower to maintain an honest pack, well done throughout. Honesty in this case is not sentiment; it is a distinct commercial asset and must be regarded from that standpoint. If the grower is not willing to put a full measure of honesty into the box pack, making every layer of apples in it as good as the top, and is not at the same time able to put up a high grade pack, one with which the best barrel stock cannot be compared, he had better give up the box and pack into barrels. He will get more money for the common stuff in barrels than in boxes and save a lot of trouble besides. It is really depressing to see how many boxes of medium grade stuff, poorly packed, come in from this section. Much of it is fit for peddlers

Digitized by Google

only. Do you wonder that commission men are opposed to our growers packing in boxes? They would not be opposed if we did it right.

I do not wish to discourage the grower who honestly intends to do the work as it should be done. He may not succeed very well the first year, but that is another matter. Box packing is a new and difficult thing to learn. Progress is at first necessarily slow. But if the man has the proper spirit behind him he will improve from year to year, until ultimately he may be able to market a large share of his product in just as good form as the western growers do, meanwhile working up his reputation and then getting as good prices as they do.

Associated with the problem of marketing is the problem of grades. Many different sets of terms are used to designate grades of apples. A uniform system should be adopted for the nation. None appeals to me as being more practicable than the grades adopted by the Canadian government. Under this system the terms, Fancy No. 1, No. 2 and No. 3, are used. Instead of giving these grades just as they are worded in the Fruit Marks Act (now a part of the Inspection and Sales Act) of Canada, the principal features of the several grades will be given in tabulated form so that the differences will stand out more clearly. This table follows:

REQUIREMENTS OF THE GRADES OF FRUIT AS DEFINED IN FRUIT MARKS ACT OF CANADA.

Fancy	No. 1	No. 2
No culls.	No culls.	No culls.
Well grown specimens.	Well grown specimens.	
One variety in a package.	One variety in a package.	
Fruit sound.	Fruit sound.	
Size uniform in each package and at least normal for the variety.	Size not less than medium for the variety.	Size not less than nearly medium for the variety.
Good color for the variety.	Good color for the variety.	
Normal shape.	Normal shape.	
Free from worm holes, bruises, scab and other defects.	Not less than 90% free from worm holes, bruises, scab and other defects.	Not less than 80% free from worm holes and such other defects as cause material waste.
Properly packed.	Properly packed.	Properly packed.

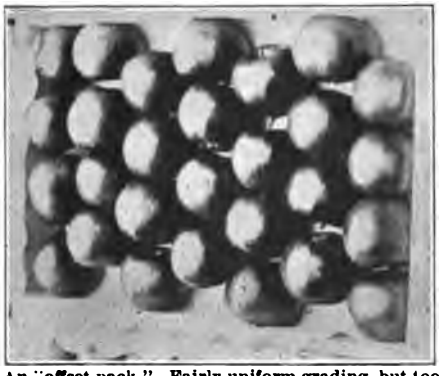
Digitized by Google

Grade No. 3. Not defined, but comes under the provision which requires that "not more than fifteen per cent. of the fruit shall be substantially smaller in size than, or inferior in grade to, or different in variety from, the faced or shown surface" of the package.

The same provision applies to the other grades as well, which has considerable significance in connection with Grade No. 2.

The Canadian law requires one of the four marks to be placed on each closed package, but any private mark designating grade or brand may be placed on the package in addition to one of the four required, provided it "is not inconsistent with, or marked more conspicuously than the one" of the four marks required by the law.

The grades given are simple, practical and comparatively easy to follow. I think that they would be good ones to adopt for our state. Our society ought to take action looking toward the adoption of such grades. I think that a committee ought to be appointed to consider this matter during the coming year, and to report legislation along this line at next year's meeting, which, if satisfactory, the society might recommend to the next legislature. Not only would the consumers be greatly benefited as the result of the adoption of such grades, for they would then know just what they were getting, but the whole business of apple growing would be greatly benefited thereby, for the simple reason that a greatly increased demand for apples would result. Does not every one here who buys apples feel that he would buy a barrel of them much more readily and much more often if he knew just what that barrel would contain through and through?



An "offset pack." Fairly uniform grading, but too loose packing.

I cannot dwell upon the best means of selling the apple crop. A retail trade will usually bring the best price, but this system is seldom practicable. The next best thing is direct connections with retail dealers, but the amount that can be sold this way is also limited. For some, selling in the orchard would be most satisfactory, and a number of other methods might be followed. It remains, however, that a large share of the apple crop of the state will necessarily have to be consigned to commission merchants. Are they honest? I believe that many of them are. If an evil, they are certainly a very necessary evil, else how

Digitized by Google

could all of the fruit which now goes to them reach the ultimate consumer. Few growers have the direct connections necessary for selling any considerable quantity of apples without the aid of the commission merchant. While growers are asking whether commission merchants are honest—and many certainly do seem very unreliable—it might be well for them to ask how honest they themselves are in the way they pack their fruit for market. Some growers have discovered that the way to "reform" a commission merchant is to reform their own methods. Every commission house has a regular trade. They want, for a certain class of trade, fruit that they can send out with a feeling of confidence that it will prove satisfactory. If your pack is of good, uniform grade throughout, and the commission man has had your trade long enough to know that it is reliable, he can send it out to his best trade at his best price with a feeling of confidence. If your pack is of doubtful character, he must usually accept a lower price according to the degree of doubt which he or his trade feels concerning it.

In closing, may I ask that we all work together and do our best to improve our methods in growing and marketing apples.

Col. Burnap: You say the apples must be just ripe enough and not too ripe?

Mr. Kohler: That is a little difficult to explain.

Col. Burnap: That is just the reason why I asked you, we want to know.

Mr. Kohler: Some say we should wait until the seed begins to turn brown. We cannot always go by that indication. Take the Wealthy: we have to pick them a little earlier than we would like to because they have a tendency to fall. You can readily tell when the apple has reached the point when there is danger of its becoming over-ripe. I would let it come as near to that point as possible and then pick it. If you have a large quantity to pick you will have to begin earlier than if you have a smaller quantity.

Col. Burnap: That means to let them become fully colored?

Mr. Kohler: Yes, you can let them acquire considerable color.

Col. Burnap: How many pounds are there in a bushel?

Mr. Kohler: From forty-five to forty-eight pounds a bushel; forty-eight pounds is considered a bushel.

Col. Burnap: Yes, but some are heavier, and some are lighter.

Mr. Kohler: I think fifty pounds is too much. I do not know that we can fix the exact number of pounds, but I think forty-eight pounds to the bushels is sufficient.

Col. Burnap: Forty-eight pounds when the apples are not ripe, but when apples are ripe and dry, in a dry season, it will not do.

Mr. Tingley: Why cannot the same grade of apples be packed in barrels as well as in boxes?

Mr. Kohler: Custom is a factor that must be considered. It seems to be the experience of commission men that they do not get as

Digitized by Google

much for apples that come in barrels as they do for apples packed in boxes.

Mr. Husser: Would it not be a good idea to ask the legislature to pass a law requiring that every package shall be covered so that the contents can be plainly seen, and that every one be required to have his name on the package or crate as well as the name of the variety of fruit it contains?

Mr. Kohler: He should have his name and address on the package, and the variety also; that would be a very good thing.

Mr. Benjamin: I want to ask Mr. Kohler whether he ever tried to get forty-eight pounds in a bushel basket?

Mr. Kohler: I have not tried it.

Mr. Sahler: I have tried it, and I can't get more than forty-three pounds in a bushel basket.

Mr. Drum: The Hibernal will weigh light.

Mrs. Black: What is the best way of cooling apples after picking?

Mr. Kohler: Put them in the shade or let them remain in the cold night air. That is about the best you can do at home.

Mr. Kellogg (Wis.): Apples must have good ventilation.

Mr. Kohler: Yes, that is very necessary.

Mr. Benjamin: What do you think about using ice?

Mr. Kohler: That would be a good idea if you are in a position where you can use it.

Mrs. Gould: Would it be a good plan to wipe an apple with a cloth?

Mr. Kohler: Well, if they are wiped at all they should be wiped very lightly. You don't want apples to shine. If you wipe them at all you want to wipe them lightly, because the natural bloom should always be on the apple.

Any apple which is ripe enough to show signs of softening is past the stage for successful cold storage treatment. Any decay in the form of rots, especially the ordinary brown or soft rot, will be arrested very little if arrested at all.

Apples which are well matured on the trees, but still firm, will keep better and longer than if picked at an earlier stage. Well matured apples show less tendency to scald. This is very marked in the case of the Greening. In tests which the Department made in 1909-10, apples of this variety picked rather early at a certain date, scalded badly in cold storage, while others from the same tree picked three weeks later were almost free of this rather serious defect. If the Greening has reached the stage when it shows a faint blush there is not apt to be much scalding. A good color seems to be a great protection against scalding in all varieties.

If the strawberry plants are vigorous, and the bed not too weedy, it may pay to renovate it for another year. Mow the plants close to the ground, rake off the foliage and burn it. Plow a furrow, cutting out all but about one foot of the row, and then go through and take out the weeds and diseased plants in this row. Fill the furrow with thoroughly rotted manure and cultivate the soil back. Keep up a thorough cultivation of the soil all the season.

Digitized by Google

(See page 283.)

EXPENSE AND INCOME FROM 118 TREES IN SOD AND 121 TREES IN TILLED PLATS.

Year	Fertilizer		Mowing	Cultivating	Pruning		Spraying		Harvesting		Total Expense		Net Income	
	Sod	Tillage	Sod	Tillage	Sod	Tillage	Sod	Tillage	Sod	Tillage	Sod	Tillage	Sod	Tillage
1904	$15.05	$15.05	$19.99	$33.75	$14.625	$14.625	$ 58.225	$58.225	$219.25	$210.90	$327.14	$ 332.55	$ 225.76	$ 185.34
1905	18.60	18.60	7.46	48.71	13.25	13.25	44.27	44.27	82.89	96.85	166.47	221.68	330.28	255 60
1906	17.00	17.00	3.36	30.30	15.12	15.12	46.51	46.51	104.30	231.80	186.29	340.73	154.96	392.42
1907	8.37	8.37	3.67	46.63	15.33	18.31	73.84	73.84	138.07	224.20	239.28	371.35	487.16	800.31
1908	.....	.....	6.14	36.67	16.865	22.125	50.45	50.45	173.43	338.59	246.885	447.815	353.865	723.415
Total	$59.02	$59.02	$40.62	$196.06	$75.19	$83.41	$273.295	$273.295	$717.94	$1102.34	$1166.065	$1714.125	$1552.025	$2457.085

The average income per acre on the basis of 27.2 trees is sod $71.52, tillage $110.43. Percentage of average annual increase of tillage over sod 54 per cent.

Digitized by Google

GARDEN HELPS
Conducted by Minnesota Garden Flower Society
Edited by Mrs. E. W. Gould, 2644 Humboldt Avenue So., Minneapolis

The Iris.

The cool, moist spring was so favorable to the finest development of iris that the gorgeous display of these splendid flowers throughout June stirred up much enthusiasm for iris culture. Many new admirers are planning to plant irises, while old friends have been spurred on to achieve finer results than heretofore.

Whoever may be planning either to plant anew or replant any of the irises of the Germanic type should speedily complete his arrangements, for the ideal time for such work is during the first cool and moist weather after August 15. These German irises grow vigorously until about August 1, and then become practically dormant, although the leaves remain unchanged. They are handled with least injury during their rest period, and planted early they become well established before cold weather, and make a very good showing the first spring if strong divisions have been planted. Irises may be planted at any time before the ground is frozen, as they are not injured by frost, but they will not be so well developed if planted late. An additional reason for fall planting is that the best stock is obtainable then, for the iris specialists arrange their business with reference to this season.

There are literally hundreds of fine irises to choose from, all of which are excellent; but wide variety is no great object in German iris, as they are never more effective than when grown in large masses of one variety or of two or three varieties so similar in general appearance as to give a uniform effect. A dozen carefully selected varieties will give the full range of distinctive colorings and will permit considerable range in the matter of height and season of bloom.

To get the most out of growing German irises care should be taken to include some extra early and late kinds. The selection of early varieties should include both Flavescens (creamy yellow) and Florentina (white tinged with lavender), and one or two of the true German varieties in deep blue or purple, say, either Amas, Kharput or Purple King. Benacensis is the earliest purple, and the flowers are large and handsome. Mandraliscae is also a fine early violet colored flower. Of the late iris Pallida dalmatica, Billotti, Prince of Orange, Mdme. Chereau, Innocenza, Cythere, Mrs. G. Darwin and most of the Squalens varieties will give abundant variety.

Among the midseason group the following twelve will give all the good qualities of the family: Mrs. H. Darwin (white slightly marked with violet), Victorine (white and purple), Lord Seymour (white and pale lavender), Mrs. Neubronner (golden yellow), Honorable (yellow and mahogany), Maori King (yellow and maroon), Gracchup (yellow and purple), Queen of May (pinkish lavender), Celeste (lavender blue), Sappho (deep bluish purple), Walneri (deep lavender), Jacquesiana (purplish yellow and maroon).

For mass effect, delicate markings and gradations of color count for nothing, and self colors, like Pallida dalmatica and Flavescens, give the best effect, although some of the strongly marked combinations of white and

Digitized by Google

purple, two contrasting purple tones, or yellow with either brown, crimson or purple, are good—particularly in isolated beds.

Most of the Sambucina and Squalens types, while often beautiful when closely inspected and often good for cutting, are dull in the garden. Some of the Sambucina varieties are worthy of a place in a considerable collection if only on account of their refreshing elder scent. The matter of scent should not be overlooked. All the Pallida varieties have a delicious orange scent, and Mme. Chereau, Flavescens, Sappho, Fragrans, or Storm King, Queen of May, Maori King, Billotti and Cypriana have fine odors.

Iris are especially fine in masses, alone or in somewhat formal arrangement, such as long edgings or bands or clumps regularly faced. Delicate plants do not neighbor well with tall iris, but tall phlox, helianthus, Michaelmas daisies and other vigorous late blooming plants make a good background for all of the German irises, while at the front edge of the border sufficient room should be left for a planting of spring bulbs, dwarf iris and strong growing, tufted edging plants.

Irises grow vigorously and spread rapidly and as a general rule should be divided and the bed remade about every fourth year. The divisions should not be made too small and should be planted about a foot apart in deep, well-enriched soil, but no manure must be permitted to touch the rootstocks, which lie on top of the ground naturally. In planting, the soil should scarcely cover the rootstocks, or they will rot. As irises are partial to lime the use of a liberal amount of bone meal is desirable in preparing the border, and this can also be given them in the spring. A top dressing of well rotted manure may be given in the fall, but it must be carefully removed early in the spring and forked in not too close around the clumps. If the plants are kept well fed in this way it is possible to get good results for a good many years without entirely remaking the border, but pieces must be taken out here and there when the rootstocks become crowded, as they are inclined to rot when crowded, and at least become feeble and ill-nourished and produce few flowers.

MRS. MARTHA A. WYMAN.

The fuchsia likes a good deal of water, both at the roots and overhead. If the drainage is perfect and the soil light and porous it is difficult to give it too much. It must never be allowed to become dry at the roots or it will receive a check and probably drop its leaves and buds.

As most varieties are of slender habit, some support is needed. The use of racks or trellises is to be deprecated; they are heavy, unsightly affairs, and a plant trained on one is never very graceful. A very satisfactory support is a stout iron rod with holes punched five or six inches apart. Through the holes run a heavy wire, twisted in and out in such a manner that the loops in it project eight or ten inches on all sides of the rod. Do not attempt to make these regular; they will not be seen when the plant grows up, so it doesn't matter how they look when the frame is made. Tie the main stalk to the rod and let the branches dispose of themselves among the wires. Trained in this way a naturally graceful specimen can be had, in contrast to the formal, prim, flat, rack-trained specimen.

Digitized by Google

SECRETARY'S CORNER

POPULAR FRUIT GROWING REVISED.—The publishers of this valuable and practical work, the crowning service of the late Prof. S. B. Green's life to horticulture, is now in its fourth edition, and a few changes have been made in it in answer to demands from the classroom, and an appendix added, under the management of Prof. LeRoy Cady. The book is slightly enlarged to 328 pages, price continuing as heretofore, $1.00. It is offered as a premium to any one securing two new members to this society or one member and fifty cents, or it will be mailed direct upon payment of the full price. If you are not in possession of a copy, you would find it a wise investment.

FRUIT AND FLOWER SEEDS FOR EXPERIMENTAL PLANTING.—Mr. Chas. Haralson, superintendent of the State Fruit-Breeding Farm, is saving a quantity of seed from some of the more valuable seedling strawberries, also everbearing strawberries. Some seed is also being saved from the seedling raspberries fruiting there, and a considerable quantity also from Rosa Rugosa crossed with hybrid perpetual roses. This seed will be sent out from this office, probably at the uniform price of ten cents per package, to those who are desirous of experimenting with it, and we hope a large number of the members of the society will be interested to secure it. Full directions will be furnished.

Applications may be made at any time, though the seed will probably not be sent out until next spring as this plan seems to offer the greatest probability of success. Those receiving and planting this seed will by this act become interested in growing new varieties of fruits and flowers and have their names placed upon the roll of the Plant Breeders' Auxiliary, which, however, will involve no expense to the member.

FRUIT AT 1912 STATE FAIR.—The premium list of the coming Minnesota State Fair is at hand, and copies can be had by applying to Secretary J. C. Simpson, Hamline, Minn. The fair is to be held this year Sept. 2-7, which, with the advanced condition of the season, should bring fruit in fairly good degree of ripeness for exhibition. Mr. A. Brackett is in charge of the fruit exhibit again this year and may be addressed in connection therewith at Excelsior, Minn. Mr. Gust Malmquist, of Fair Oaks, Minneapolis, is now for the third time in charge of the flower exhibit in the horticultural department. There are offered for prizes in this department for fruits $1,668.00 and for flowers $1,853.00. Regulations of fruit exhibit are practically the same as previous years, and the premium list is not greatly changed except in the newer class of apples in boxes. In this class there is $490.00 offered. There are four lots of full boxes and one lot of two layer boxes. As apples shown in this class need not be grown by the exhibitor, though they must be grown in the state, there is no reason why there may not be a goodly number of exhibits in it. Other classes are practically the same as previous years.

There will be an exhibit of nursery plants. This, however, is not competitive, but is to be made by the School of Agriculture.

Digitized by Google

Digitized by Google

HOME GROUNDS OF HENRY DENSMORE, AT OLIVIA.

Buckthorn trimmed as a sphere, for which owner was offered $150, showing the tractability of this shrub so generally used for hedges.

Digitized by Google

☞After reading this magazine, will you please pass it along to some friend who will appreciate it and whom you may perhaps interest to become a member of the society—at least he should derive benefit from its reading. By distributing in this way the twelve magazines received during the year 1911, at the beginning of the next year—upon renewing your membership in the society—you will be entitled to receive postpaid a cloth bound volume containing all the magazines for 1911 and much other interesting matter, with a full index of all its contents, entitled "Trees, Fruits and Flowers of Minnesota," a handsome book for your library and invaluable for reference.

THE MINNESOTA HORTICULTURIST

Vol. 40. **SEPTEMBER, 1912.** **No. 9**

Ornamental Planting for Winter Effects.

CHARLES H. RAMSDELL, LANDSCAPE DESIGNER, MINNEAPOLIS.

Can you imagine more inspiring scenery or grander surroundings for every day life than among the hills and mountains in winter, or in summer if they are snowcapped at that season? The grandeur of such a sight is unsurpassed, especially to us who live on the more level plains and prairies. But if we should see the mountains without the snow and denuded of the evergreen trees usually found, we would turn away disappointed and seek the immensity of the sea or the plains, or the magnificent power of the river and waterfalls, for our love of natural scenery. To analyze the views of the hills, we will find the part played by the evergreen pine and spruce a most dominating factor. The contrast of the deep green of the evergreen with the blue of the sky, the dazzling whiteness of the snow or the lighter greens of the deciduous trees in the summer, contain to my mind most of the elements of the wonderful picture. This is nature unhindered by artificial work of man. One of the purposes of landscape designing is to bring a few suggestions of such pictures to the eye of man in his home or about his town or city in every day life, and to attempt any winter effects in such work without evergreens would be to take away nature's most valuable materials for it.

The early pioneer on our wind-swept prairies was little better off in the selection of evergreens than was he in his efforts to find hardy fruit trees. However, the investigations of the government and of almost every horticulturist and nurseryman of the region have enlarged the list of available evergreens hardy in our northwest. Better methods of planting and handling have resulted in smaller loss of plants, and with due care there is no reason why evergreen loss should be much heavier than that from deciduous trees. But no pains or expense should be spared in such work to insure best results. In this article, I shall disregard the use of the broad-leaved evergreens, the rhododendrons, laurels and others which are not hardy to our region.

Digitized by Google

These would be highly desirable, but they are not available for our work.

In a general way one can place all evergreen planting for landscape effect under three heads: The first might be called useful planting, which would include shelter belts and windbreaks to farms and buildings and planting for timber. The second classification could be called natural planting. This would include foresting of slopes and hills to prevent soil-washing and to conserve water supply, the planting of evergreens for backgrounds, for screening obtrusive objects and views, and massing about buildings for seclusion or appearance. The third classification could be called formal planting. This would include hedges, where desirable and appropriate, the placing of specimen trees in symmetrical arrangement about entrance or building, and evergreen planting as an adjunct to formal gardening, either as specimens or to dominate as a design for winter effects.

In order that you may understand me somewhat better, I will illustrate each of these classes briefly in turn.

To take up useful plantings, I will describe this little picture which is familiar more or less to all of us. I see in my mind's eye a prairie homestead well set back from the highway, with neat home buildings, tastefully painted, say in white or gray or brown, farm buildings to the side and back but still convenient to the roads. But what sets off these buildings so well? Why is it so quiet here that the cattle are allowed to run in their yards this cold zero day with the prairie snow blowing everywhere? The answer could be found in the fine windbreak of pine and spruce to the north and west. Here I see some magnificent Black Hills spruce, thirty-five feet high, Austrian pines which may have been the pioneers and others. Possibly there will be found later the Norway spruce, the white pine, the black and the Colorado blue spruce. Where did this farmer get his fine cedar fence posts? From his shelter belt, of course, the cedars, the Austrian pines, the Jack pine or the Black Hills spruce being the first plantings to stand the wintry blasts and summer droughts of the prairies alone and first handed. As fine red cedars as ever I have seen anywhere made up a shelter belt for a western Kansas farmer. Perhaps some authorities would plant a belt of deciduous trees inside or outside for more fence posts, etc. This is a matter of taste. But in a permanent shelter belt, solid plantings of one kind will do the best as well as give a more typical effect. Only a few kinds of spruces are very tolerant of the partial shade of the forest or closely planted shelter belt. The first plantings not more than six feet apart will result in the most timber and closest shelter belt for windbreak purpose.

Digitized by Google

To turn to the second class, planting for natural effects. Here I can picture a background screen for a cemetery, perhaps more or less crowded by its city neighbors. The drive winds along the border, following natural contours in its curving. On one side I see the usual cemetary conditions, but without the obtrusive headstones and monuments which change the natural park into an advertisement for the stonecutter's designs. On the other side I see a smooth lawn with a few groups of trees, sloping up to the evergreen border planting, which dominates this entire side of the cemetery. First we note a solid planting of thirty or forty Norway spruce, fifty feet high and perfectly spaced so they occupy all the ground. They may have to face them down to the lawn edge some round Mugho pines, perhaps some perennials in between. Next we note a large number of the Norway pine and white pine, with tall cedars to fill in, as the pines are rather tall and thin standing alone. In the center we might find five or six Colorado blue spruce giving color to the mass. Beyond we might find Abies concolor, the white spruce and the tamarack for a change of foliage effects and so on. For the lower massing next to the lawn, we might have the dwarf arbor vitaes, the ground juniper, the cedars and Mugho pine. In masses for summer effect the perennials are useful. Altogether one would scarcely realize the row of closely built tenements facing the bordering street.

Chas. H. Ramsdell.

To take the formal gardening with evergreens, I see in my mind a winter garden for a city resident who spends his summer at a neighboring lake with gardens and flowers enough to satisfy anyone. Standing in the center window of the large living room, we find the garden axis extended from the room axis. The garden is bordered by a stone parapet of the house material, narrowing down to the end a hundred feet distant. At the end of the central path stands a single blue spruce,

Digitized by Google

largest in all the garden. Then on each side for winter contrast are planted the red and golden twigged dogwood. The garden beds are arranged formally, similar to flower beds, each bed centered by a trimmed and formal red cedar. In these beds for lower material we find the compact arbor vitae, the silver tip arbor vitae, the dwarf juniper, the Mugho pine, the savin and ground yew and some striped grass, and Eulalia zebrina variegata, which stands up quite well through the winter snow. Such a garden does not depend on the flowering season and warm weather for its attractiveness.

Of course, there are also shrubs and trees with the good winter twig colors, the red and golden twigged dogwood, the golden willow, the red barked willows and others; and for berried shrubs, the barberry, the deciduous holly, the high bush cranberry, the mountain ash and so on. But for striking effects in winter, one must depend on hardy evergreens. It is well also to bear in mind that to many people much evergreen planting on small grounds is apt to be gloomy and somber in effect.

Following out these lines of work we can locate good evergreen planting in parks where many people pass in winter, lawn specimens on small grounds, foresting hills and knolls for timber as well as for their attractiveness and even the planting of pines and spruce as game coverts as practised in Europe. In truth the following of horticultural work with evergreens offers as good a field for attractive landscape work as does the usual tree and shrub work so often seen. In addition the planter has the satisfaction of providing attractions out of doors in winter, a time when other plants are leafless. Especially this lack is apt to send us all indoors, while we should watch the attractions of nature with snow, as well as grass, for foregrounds of our views out of doors.

Mrs. Gould: It is difficult to grow hardy ornamental varieties.

Mr. Ramsdell: Yes, it is a most difficult problem to handle. I know of a white pine which I first observed some years ago when it was a very fine tree, but later it was affected by the severe cold, and it died in three years. It is almost impossible to do anything in this problem on account of the winters. For that reason ornamental planting for winter effect is quite a problem.

Mr. Emmans: If you have something very choice in the way of varieties, something you desire to save, would you advise protecting them for two or three years?

Mr. Ramsdell: Yes, it is the desirable thing to do, but if possible I would select a variety that did not need protection. I do not like to see cornstalks and such things as that put around a tree. Anything like that at once destroys the effect which was originally sought to be brought out. If you have any variety which you would like to save, I would recommend covering by all means, but I would prefer varieties that do not require protection.

Digitized by Google

Needed Changes in the Minnesota Horticultural Inspection Law.

H. B. SCAMMELL, ASST. INSPECTOR MINNESOTA NURSERIES,
ST. ANTHONY PARK.

The present law applying to horticultural inspection in Minnesota was enacted by the legislature in 1903 and revised in 1905. It filled a long felt want and has served its purpose fairly well during the past eight years, but there are some features embodied in this bill which do not cover the situation existing today, and it is earnestly hoped that some changes and additions may be made, desirable from the standpoint of the inspector as well as from that of the nurseryman, which will become part of the law at the next session of the legislature.

Some states in which fruit growing has become one of the leading industries need and have adopted laws sufficiently stringent to afford good protection within their borders; other states, such as our own, the Dakotas and lesser fruit raising states, have horticultural laws less severe, and it seems right that differences in the state laws should exist because of the differences in conditions which are found in various parts of this country.

Our own law is of a type quite different from that of California or New York, but our nursery and fruit growing interests are not developed to the same extent as in the former states, and it would seem that with some changes we could secure a law which would better satisfy Minnesota conditions.

The most noticably weak point in our law is that which limits inspection to places where trees or plants are grown for sale. This may be done at the request of the owner or when the inspector has reasonable ground to believe that any injurious insect pests or dangerous plant diseases exist, but bear in mind that at none other place than that where stock is grown for sale may it be inspected. Minnesota nurseries and orchards have been comparatively free of serious insect pests, but suppose an orchard is found infested with San Jose scale, and the owner refuses to spray. In such case he cannot be reached under the inspection law, but possibly something might be done under some other law, such as maintaining a public nuisance.

It should be required that every nursery be inspected at least once each year and the right granted to examine any place which the state entomologist may have reason to believe needs attention. It cannot be too strongly advocated that a list of the places from which buds and scions are secured by nurserymen be obtained from them, and a careful inspection be made of the trees from which the buds and scions

Digitized by Google

are taken. These are often responsible for the outbreak of an infestation of scale insects, such as San Jose, oyster shell, Putnam and scurfy. The first named is not known to exist in our orchards, but the latter three are quite common, and should trees bearing them be shipped into a state where all nursery stock received is inspected they would undoubtedly be destroyed.

In no section of the law can there be found a statement saying that shipments within the state should have a certificate attached. Shipments destined for other states require it, and it was to meet that requirement that the present law was passed, the idea being to enable nurserymen to do business outside the state but not being sufficiently particular about the business done at home. Certificates should be on all shipments, whether outside the state or within. To revoke or withhold a certificate at present means only that the nurseryman is prohibited from shipping to other states requiring certificates and still allows him to do business within his own state. To require only those nurseries which ship to other states to be inspected aims at protection for those states chiefly and not sufficiently at protection for our interests at home. Minnesota needs protection for her own sake as well as for the benefit of surrounding states.

This leads to the question of who shall pay for inspection, the nurseryman or the state. The Minnesota law reads that a fee of five dollars per day and expenses shall be collected for the inspection of a nursery. When a number of nurseries are on a circuit it is a most difficult matter to determine the sum to be collected from each, especially the apportioning of the expense account, and it is almost impossible to do this in any way except approximately. The important point in connection with the matter of fees is that the inspector does not always feel at liberty to spend as much time as he would like in a nursery because such time is being paid for by the nurseryman, and it is only fair to him to keep expense as low as possible. There are two nurseries here, perhaps a third, that, were they in a state where San Jose scale is common, each would require the time of two men for six or seven days to be properly inspected. This scale having been found in two nurseries this year, received in both cases from eastern states, it has become necessary to spend more time in these examinations, and it is recommended that either the work be done at state expense or a small fee without expenses be charged in order to give the inspector every opportunity to spend a sufficient amount of time in the inspection. An examination of the horticultural inspection laws reveals the fact that in approximately one-fourth of the states inspection is made at the expense of the nurserymen, and usually a

Digitized by Google

fee is charged in addition, while in the other three-fourths the states appropriate funds for this purpose.

The time allotted for this paper permits me to speak of one other point, which is, that the term "nursery stock" should be defined in the law. Such definition must be broad enough to cover the florists' stock which is received here in the fall from Europe, and permit of its inspection. This stock is often classed as greenhouse stock in this country, but being field grown in Europe it should be inspected for brown tail moth's nests and gypsy moth egg clusters. A word of advice to those who ship greenhouse stock will not be out of place here. This may be shipped into the state or out of it without a certificate and in order to avoid any delay which might arise if an inspector should hold up a shipment for inspection because of a lack of certificate, every greenhouse manager should clearly label each package with the words "Greenhouse Stock."

This gives an opportunity for an unscrupulous man to practice deception, but if the necessity arises a means will be found to detect such an act.

Horticultural inspection laws are still in the formative period, but constantly changing for the better. Weaknesses are being found and corrected, and it is only by continually striving for their improvement that laws can be secured which will effectually control the situation.

How Does Thinning Help? The average size of the fruit left on the trees is increased; this is the most obvious result of thinning. Trees overburdened with fruit produce a greater percentage of number two apples. The increase in size of the remainder, after the first or second picking is made, is a striking instance of the increase in size when the number of fruits is reduced.

The fruit borne is more uniform in size and shape. On the over-loaded tree there is much variation in size, and especially where two or three fruits remain on a spur they are variable in shape as well. The fruits from the side blossoms of the cluster are in many varieties much different from those from the center blossom.

Stalk borers are the worms which make holes in the stems of lilies, dahlias, golden glow, peonies and other flowers, causing the stalks to fall over. They come originally from weeds, and the eggs are laid at the base of certain weed-stalks in the fall and hatch the following spring. A garden adjoining a weedy, neglected lot is apt to be troubled. Sticky tanglefoot of medium thickness, which can be bought easily in large quantities, applied over a space of three inches wide on the outside of the base-board of a fence, or a board barrier placed for the purpose, has been found to be an effective preventive, since the worms cannot cross the sticky band. This should be done early in the season, and calls for more than one application in order to keep the barrier sticky.

Digitized by Google

My Summer in a Garden.

MISS SABRA M. ELLISON, UNITY HOUSE, MINNEAPOLIS.

Much has been said and written in praise of gardens. Ministers tell us the story of Eden and prove that man comes naturally by his fondness for gardens, and that God loves gardens, too. Poets and philosophers go to their gardens for inspiration, and other writers give us stories like "Elizabeth and Her German Garden," full of glowing enthusiasm for plants and flowers, for the ground they grow in and for the air, sunlight and moonlight which surrounds them. Few people object to all this praise of gardens, but few people perhaps know how true it all is.

I myself have always believed in gardens, but it was very little first-hand knowledge I had when we went out to a small farm several summers ago. My acquaintance with practical details is not all that might be desired now, but it is considerably greater than it was then. Then I was told I even lacked the gardener's instinct. The immediate occasion of this was my aversion for small plants—flowers or weeds. I still prefer garden plants of some size, and I like the blossoming stage best. But as for weeds—I have learned not to despise the day of small things. You will doubtless agree with me that onion weeding in the vegetable garden is a successful means of developing this sentiment.

Of course there is work in a garden, but a reasonable amount is the most healthful thing in the world. And it is true of gardens, as of other things, that we appreciate most that for which we must exert ourselves and sacrifice to a degree. The man who can and does put his hand into his pocket and buy everything ready made does not by any means get the most pleasure out of life.

Perhaps you would like to know what we have in our garden. There are tulips, of course, to let us know that spring is coming; and violets, and lilies-of-the-valley, and pansies, and forget-me-nots—these last two being a joy clear through to cold weather. Indeed, the pansies are as great favorites as anything in the garden. There is diversion by the hour in studying pansy faces, in learning the individuality of the various blossoms, and in arranging them in new combinations. The handsomest bouquet we ever made was a large bunch of black and yellow pansies. I think I should never tire of having such a bouquet on my table. We found it an extremely popular way of entertaining our guests to send them to the pansy bed. Forget-me-nots are so attractive I wonder they are not more common. I was perhaps grown up before I ever saw them, and then it was such a satisfaction to find buds pink like the pictures.

Digitized by Google

Another of our favorites is the columbine. If you wish to make a bouquet which will cool you off just by looking at it on a hot June day, choose a few sprays of yellow columbine and white; arrange them with a little asparagus green in an open dish and add a few long stemmed yellow and white pansies. This bouquet really belongs to the same category as ice cream and lemonade in hot weather.

Then there are the marguerites and the pinks, an old-fashioned flower with a fragrance than which there is nothing finer; and the Iceland poppies, which last all summer and make more cool bouquets; and the oriental poppies, a good June flower; and the peonies, which it would be folly for me to attempt to discuss. I am surprised that pyrethrum or painted daisies are not more popular. They have a double season, too, to their credit. Iris are extremely satisfactory; sweet william and bleeding heart one must also have. And by the coreopsis one must pause, with a bit of praise for the great long stems and big yellow flowers, which are extremely good for house bouquets all summer long and well into the fall.

Canterbury bells are universal favorites, and so are Shasta daisies. But our prize bloomer is gaillardia. It is a mystery to know how plants can bloom so much and so long—from June to November—and give large flowers at that. Gaillardia is extremely good for house decorations but is rather particular about the vase in which it displays its red and yellow glory, being quite averse to looking well in a large mouthed dish. Golden glow we also like for decorative purposes in the house as well as out of doors. We planted larkspur beside our golden glow, and one visitor said, "I just love you people for putting that blue and yellow together."

Hollyhocks, of course, must be given a place. Achillea we planted for white, though it was not quite satisfactory. We had, too, gypsophila, or baby's breath, an airy, fairy little plant especially good in sweet pea bouquets. It is fun to have a few "red hot pokers" around, but they are not entirely hardy. I never saw them until last summer and thought them a new flower until a lady said, "Oh, we had them years ago in Michigan."

Scabiosa deserves a better name, but almost overdoes the matter in laying claim to "mourning bride." Helenium is an interesting development from the wild species, specimens of which we have in our own meadow, and is very refined in coloring. The cultivated black-eyed susans are good substantial flowers. The autumn daisies make an extremely beautiful white hedge in the fall, and boltonia is not bad.

Digitized by Google

Chinese lantern plants are great land grabbers; but the red and orange pods which develop in the fall, and hold their color for years, are as beautiful as they are unfamiliar to most people.

Pods of Chinese lantern plant.

Besides these perennials we are making a start with flowering shrubs, such as lilacs, spirea, Juneberries, honeysuckle, weigelia and barberries. And then there are all the annuals, foremost of which we rank sweet peas, but they are another story.

Digitized by Google

I picked our last stray flower the 28th of October, but I have on my table now a bouquet of Chinese lanterns to remind me of my "summer in a garden."

Capt. Reed: What in your opinion are three of the most essential shrubs and three of the most essential flowers to be placed in the front yard?

Miss Ellison: I might give my opinion upon that subject, but I think I prefer to have my brother answer that question.

Mr. Ellison: I should hardly know what to pick out in answering that question. I think I should have the spirea for one shrub. The old-fashioned lilac would be another and some species of dogwood for variety. The dogwood gives a fine effect in winter time. For fine effective flowers we would want annuals and perennials, and it would be hard to pick out three.

Miss Ellison: If you want something that blooms all summer you want to have the gaillardia, the coreopsis and the nasturtium; those bloom all summer. It is very hard matter to pick out just three.

The President: I don't see why it should be necessary to be confined to three flowers.

Mr. Anderson: I should select the dahlia.

Mr. Husser: I would take the phlox drummondi for one.

Mrs. Gould: I would take one flower for each part of the summer. Canterbury bells in June and July, and the gaillardia I would surely have—yes, I think I would want both. (Laughter and applause.) I would not want to leave out the fall daisy either; that is one of our beautiful flowers. The canterbury bells will give you a long blooming period in June and July, and then by cutting them down you will have a second blooming period late in the summer. Heliotropes have their greatest blooming period in July, but by cutting the high stalks off you would get a later blooming period. I do not think I can confine myself to three flowers. I should want a mixed border, and then you can have bloom from April until the snow flies.

Mr. Gardner: I would like to make a motion that that number be increased from three to twenty. (Laughter.)

Mr. Gardner: Well, you can't get along without less than three kinds of phlox any way. (Laughter.)

Mr. Underwood: About a five-acre patch of phlox is a good quantity to have.

The President: Summer before last when we had no rain at all the phlox subulata kept blooming until frost. It is just as pretty as it can be.

Col. Burnap (Iowa): Nobody mentioned the California poppy. That commences to bloom early in the season, and it continues to bloom until snowed under. Of course the oriental poppy is good as long as it lasts.

Mrs. Carpenter: What are the particular merits of the California poppy?

Col. Burnap: One beauty of the California poppy is in its long keeping qualities; if you put it in a vase it keeps a long time.

Digitized by Google

Mr. Underwood: A mixed border is the most satisfactory in the long run. We have a road from our offices and buildings to the railroad track that I wished to make as attractive as possible. The distance was about 1,300 feet. On each side of the road—where the fence line would be naturally—is a hedge of arbor vitae, next is a walk of about four feet, then a row of oak trees about forty feet apart. Between the trees in this row I conceived the idea of putting in perennial plants, alternating varieties in such a way that something would be in bloom from early spring until late fall. Owing to the long distance, it was desirable to use plants that would require but little attention. In the first place, the ground between the trees was plowed and thoroughly cultivated, making the strip about three feet wide.

There is one flower that we have in the nursery that is truly a harbinger of the permanent arrival of spring and the many good things that are to follow during the months up to the middle or last of October. It is the phlox subulata (ground, or moss, pink). This is very low growing, of creeping habit, and not over four inches in height when in bloom. It covers the ground completely and is perfectly hardy. When not in bloom the foliage has a mossy effect that is an attractive background to the later blooming plants. There are two colors, a pure white and a rose color. When the shoots start from the ground—as soon as snow appears—they indicate the color of the flowers to follow, as the white are light green and the red have a decided reddish tinge. It is interesting to watch the rapid development in growth up to the flowering period. When in full bloom the white gives the appearance of large patches of snow.

Next was put in the early and late varieties of the phlox paniculata —some of these are low growing and also earlier blooming. These were used very liberally. Between the oak trees we have alternated with peonies of different colors and also planted a yucca filamentosa. These when in bloom are strikingly showy. They reach a height of four to five feet, have a stiff sword-like foliage and from one to three and more tall, handsome spikes of large, fragrant, creamy white flowers. The effect when the row is in full bloom is quite tropical. They are quite as striking and attractive at night.

We spade around our trees every spring, and as the plants take but little nourishment or moisture from the soil we put in six or eight seeds of the climbing nasturtium. These are rapid growing and soon in bloom, and continue to increase the quantity of flowers until later in the season they are a perfect mass of color. It is very refreshing, walking back and forth, to pick a blossom and "nibble" the stem until it is the right length to place in the button hole.

A good support for perennials, or other plants needing stakes, can be made out of young cherry, elm, or other straight growing saplings. The twigs support the heavy heads of bloom, such as phlox, in a most natural manner, and if the bark shows it looks harmonious. Some double white petunias supported in this way last summer made a fine show. They were three feet high and nearly as broad. Every flower seemed to show. Little or no tying is necessary.

Digitized by Google

The Home Orchard.

G. P. WARBER, MINNESOTA COLLEGE OF AGRICULTURE.

(Awarded first prize in the 1911 Gideon Memorial Contest.)

Have you ever talked with one of these modern city-bred farming enthusiasts—one of these present-day "back to the farm" agitators? Of course you have not. You listened while he did the talking. You all know that type of an individual who has the figures on his cuffs that tell of the bushels of money in corn and hog raising; and who with flower-scented oratory expatiates upon that dream-life in God's wonderful open country—the blissful life of a farmer. In the same breath he pictures the ramblings of the swine in the wilds of the corn fields, the twittering of the birds in the forests of peach trees, and the hum of the honey-bee in the orange groves. He is not crazy. At every election he votes the safe and sane straight Republican or Democratic ticket just as you do. The only trouble is that he does not know that the present-day business of corn and hog raising is not practiced on wild expanses of baronial estates, enlivened by the pomp of the boar hunts, so common in feudal ages. The modern farmstead is scented with the odors of the hog-sty and the barn-yard rather than with the ambrosial perfumes of fruit trees and flower gardens.

These men do not know the business of farming the way it is carried on today. They do not know of the hundreds of prairie farmsteads without even shade trees—to say nothing of orchards. Yet they know that in the ancient days of Rome, fruit growing was the most important part of farming. In that age, senators and emperors were farmers and lived in the country. Hesiod tells us that agriculture was the occupation of the nobles and kings in ancient Greece. That was an age in which people went to the country to live. Pliny informs us that some carried this idea of luxurious living to such an extreme that the consuls were forced to chastise them for having their villas so large as compared with the size of the whole estates that there was more ground to sweep than there was to plow. Compare that with the size of the farmstead today—a half-acre yard with the house in the middle, and the barn, the hog house, the chicken house and the other buildings crowded around it so that the chores may be most easily done. Today the ordinary farmer is in the country to work and make money, not to live. They have gone to the other extreme.

Why is this so? Have we a different ideal of life? No, indeed, the universal conception of Paradise, today as in the past, is the Garden of Eden, wherein was made to grow "every tree that is pleasant to the

Digitized by Google

sight and good for food." The trouble is that those farmers have taken the preachers too seriously in believing that all enjoyment and pleasure is reserved for the blissful hereafter. It is not that these farmers do not like fruit. No, even the crustiest "corn and hog Yankee" has his mouth "a-watering" as he drives past his German neighbor's orchard, bountifully laden with ripened fruit. It is because he has not the time to "fool away" with planting out young apple trees and tending them until they are ready to bear their fruit. Besides, he doesn't think that he has ground fitted for an orchard anyway. Didn't he try once, and didn't every "blasted one of those trees" die on him? He tries to forget about it. When Christmas comes he buys a barrel of red apples shipped in from some other state.

G. P. Warber, Gideon Memorial prize winner.

That old Dutchman, Schmidt, of course, always was lucky to get such a good location for his orchard. He has sweet Malindas and juicy Wealthys of his own raising, enough to last all winter long. Besides, his cellar is full of preserves which the industrious housewife put up during the berry season and while those few crab and plum trees were loaded with ripened fruit. But our German friend is lucky only because he has been painstaking in his work and has not stopped at the planting of the trees. Wherever there is a good, faithful orchard it is such mainly because good care was given to the young trees instead of simply planting them and then sitting back smiling blandly, trusting that some Divine Providence would provide for their well-being without any further effort. There is no immediate cash profit in view for such plantings, so the chary farmer contents himself to eat fruit that sells as apples yet which taste like a turnip—or anything else besides a good apple.

Yet there are places where fruit growing is not profitable. Not every farmer can be a successful fruit grower. You have to consider

Digitized by Google

location relative to open markets, transportation facilities and cost of efficient labor, besides the right kind of soil and favorable lay of land for the particular kind of fruit you wish to raise. All these things are important desiderata that will decide whether or not you can successfully compete in the markets with other keen and progressive fruit growers. In order to consider these factors well, you must be a keen business man, and you must be a specialist in your line of fruit. In fact, commercial fruit growing for the general farmer is a doubtful venture at best. Co-operation and specialization is the keynote of success in the case of commercial fruit growing sections.

The purpose of this paper is to state the writer's reasons for a home orchard on every farm in the land. We will omit all discussions about commercial fruit growing, and will confine ourselves to a consideration of the following questions: (1) First, can every farmer have an orchard? (2) Second, if so, what is the best plan for such an orchard? (3) And, finally, does it pay?

In answer to the first question, it is generally held by competent horticulturists, and it is borne out by experiments, that fruit trees and berry bushes of some kinds will grow in every locality where farming is successfully practiced. Fruit trees will adapt themselves to almost any kind of a soil. Good corn land will do for most all kinds of fruits. Naturally enough, a person should avoid planting a kind of fruit that experiments have proven unadapted to his kind of a soil. It would not be wise for a farmer to plant peach trees in a heavy gumbo soil—even if the climate would permit of maturing peaches in his latitude. Investigation as to what your neighbor has, and finding out at first hand what kinds of fruits will thrive in your locality and the kind of soil and lay of land that you have, is the safest and surest guide as to what to plant. If no one in the vicinity has an orchard, good and valuable information may be gleaned from bulletins issued by the Department of Agriculture, Washington, D. C. The Secretary of Agriculture will supply information as to the kind of fruit that is recommended to be tried and which is most likely to do well in your locality. A letter addressed to the horticulturist of your own and adjoining state experiment stations will also be certain to bring suggestions of value, if you state the kind of soil you have and the lay of your land. This preliminary investigation is important, and it may mean the success or failure of your attempt at fruit growing.

I have in mind some well-to-do ranchers on the gumbo plains of western South Dakota. Three of them ordered several hundred apple trees, including Golden Russets, Malindas and Jonathans—varieties

Digitized by Google

that they had learned to like back in Missouri and Illinois. The trees were purchased at a high price from Iowa nurseries and set out in good shape. Of course they never withstood the winter in that exposed country. Another rancher, living in the same country also set out an orchard, and his trees grew, and he has a good sized flourishing young orchard now. Why? This man's success was due to the fact that his son, who was attending the Agricultural College at Brookings, South Dakota, inquired of the horticultural expert, Prof. Hansen, as to what kinds of fruit was suited for that dry upland country, with a heavy black gumbo soil. He was advised to try Duchess, Northwestern Greenings, Wealthys and Trancendent crabs, and was told to get his stock from a Dakota nursery. I cite this as an illustration because of the prevalent notion that fruit cannot be grown in all sections. The incident also demonstrates the importance of getting at the thing in the right way—the folly of trying to raise a variety of fruit not adapted to the locality, and the mistake of planting anything but hardy, native or acclimatized nursery stock. The painstaking husbandman gets an orchard, when he goes after it, no matter where he is "farming it."

Now, as to the second question, what is the best plan for such an orchard as I am advocating? My answer can be but brief, and merely suggestive of what it might be, rather than a detailed outline of what it should be. It is here that original and individual taste will govern largely. Some general considerations may be touched upon, however. To begin with, the size of the orchard and the variety of fruit to be raised will be largely determined by what your land will produce. Yet you cannot plant your orchard to all kinds of fruit that will thrive there. That would result in too large a number of varieties in most farming communities. And yet if there are boys to tend them you can well afford to have a large variety. The danger is that you will plant so largely and variedly that proper care cannot be given to all. A half-acre of fruit trees should give enough variety for the average farm household. If you were growing fruit commercially you would want to specialize along some favorite varieties, but for just home use you would make provision for a rather large variety, including a few trees of Duchess, Tetofsky, Whitney, Wealthy, Malinda, Greening, and Sweet Russets. These ought to give a fair selection covering most of the seasons. Care should be taken not to plant too many of the soft summer varieties and to provide for a good supply of winter apples.

As to the best place for locating the orchard, that will depend mostly on the lay of your land. Generally speaking, a northern slope

Digitized by Google

would be preferred. However, station bulletins cover those points thoroughly; and as before suggested, a letter giving specific description of your soil, slope of land, etc., will elicit much additional advice for your particular case. Generally, however, it is well to have the orchard planned in a minor rotation surrounded by the farmstead windbreak. Plan it as near the house as is in keeping with the working plan of your farm. This is so because it is often desirable to include an old orchard with your minor rotation, letting hogs pick up windfalls, and thus getting the orchard stirred up occasionally as well as keeping it free from insects that collect at the base of the trees in fallen fruit. These matters must be worked out differently on each farm.

As to the actual laying out of a planting scheme, it may be best for farmers generally to set out trees in quadrangles,—rows twenty feet apart each way. This will permit of easy cultivation while trees are young. and will permit inter-cropping also. Berry bushes, strawberry plants, garden truck or soiling crops may be grown between rows—and thus the ground may be made to pay for itself in some way, even before the trees are bearing.

Enough has been said as to how a farmer might best proceed to provide his own family with all of the fruit they could use to advantage. In fact most farmers are not ignorant of all these facts we have been touching upon in this discourse. They have no orchard on their farm, or have even let an established orchard be destroyed simply because they think it does not pay to bother with such work. To such people it looks like a waste of time to take care of an orchard. They get along all right without one and cannot see the use of troubling themselves with anything like that. They can raise a crop of corn and potatoes off from the same ground much more easily and not take all the chances of frosts and blights for an occasional crop of wormy fruit.

Without going into the business side of the proposition at all, it is well known that the man who works at his orchard intelligently, using the methods found best by the experiments of others, does not lose by it. The wise father here seizes upon an opportunity to interest his boys in light, instructive and congenial work—the care of the orchard. What a field for nature study! What a laboratory for gaining valuable first hand knowledge of botanical and entomological science! The pruning of apple trees, the different berry bushes and the grape vines, methods of propagation, the art of grafting and all these can easily be made to exert the most beneficial of educative influences.

Digitized by Google

Just ask a boy to whom this work was thus presented and find out whether the farm wearied him.

Does it pay? Look at the typical prairie farm, without windbreak or plantings of any kind about the farmstead. Such a farm may be productive, and the people operating it may live in a well furnished house, yet such a place can never be called a true home. That farmer is merely "putting up" with those surroundings until he has accumulated enough money to withdraw into some village, there to live. Man's soul is so constituted that he cannot find his ideal in such handmade surroundings, for even the most untutored person has a yearning for the sweets of life and a longing for some of the beauties of nature. We must give heed to this inborn love of the amenities of life. Unless we can make life on the farm more attractive, and unless we can put there such attractions as will overcome the dazzling glare and lure of city life, the problem of keeping the youth on the farm will not be solved. It is for this reason mainly that I make a plea for the home orchard. In order to bring back a love of country life, in order to bring the pursuit of agriculture and life in the country back to its ancient state of dignity, we must have the aid of the old home orchard. It is indeed the chief thing that will go to make future farm life, as Socrates described it two thousand years ago: "The most comfortable pursuit for man's servants; the most delightful to his wife; the most attractive to his children; and the most pleasing and gratifying to himself and his friends."

KEEP SWEET PEAS CUT.—A thorough watering twice, or even once, a week is better than watering every day. It is scarcely necessary to say that no pods should be allowed to form if continuity of bloom is to be obtained. The peas should be cut every day or at most every other day. A difficulty most gardeners experience is to get the sweet peas cut as they should be. A short row kept well cut is much more satisfactory than a long row neglected. One row twenty to twenty-five feet long will more than keep a household supplied with flowers, and even ten feet would give an abundance of bloom, and from this length it is not too great an effort for anyone to keep the peas cut, even in the hottest weather. Peas should not be pulled from the vines; they should be cut off with as much of the stem as possible.

Dig the chrysanthemum plants up, if planted, about the end of August. Bring them into the house before frost, usually about the end of September. These plants like plenty of water at the roots, sprinkling frequently, and a cool window away from fire in the fall when flowering. After flowering, cut the flower stems down, and stand them in a cool window or put them in the cellar until spring. The soil should only be kept barely moist during the winter. The pompon type are especially good for window plants.

Digitized by Google

Combating Aster Disease.

MRS. R. R. ODELL, MINNEAPOLIS.

The aster is such a general favorite that almost anything that can be said of it is of interest to flower growers. And as we trace its origin from the little China aster of our childhood days to the beautiful, fluffy chrysanthemum of today, it seems almost miraculous that such results could have been produced simply by patience and perseverance. But this high state of cultivation has brought with it a train of diseases, some of them so hard to combat that in some localities aster raising is a thing of the past.

Originally all that was necessary was to put the seed in the ground, and it was a sure crop. Not so today. There is more time spent on the aster than any other garden flower. I have been told by people of experience—and after years of hard work I can fully verify this statement—there are many kinds of diseases that attack this favorite, such as the something that causes the buds to blast and one-half of the bloom to blight. So far aster growers have only been able to guess the cause, but believe it to be acid in the soil. The remedy is perfect drainage and lime to sweeten the soil. Then there are several insects that prey upon it, among these the cut worm, the beetle, the heart worm and the wet worm.

About four years ago a new trouble appeared that baffled the shrewdest gardner, and it has steadily grown worse, and not until last season has even a partial remedy been found that is at all effectual. I refer to the blue aphis found on the roots. I knew it was there and was causing the trouble. In despair one day I took up a plant and dipped the root in hot water, and the aphis let go. I filled the hole with boiling water, and when the earth was cool reset the plant and shaded it for a few days, and it was the only good bloom I had that season. After dipping the root in hot water, which must be done quickly, *immediately* throw it into cold water. A delightful odor of honey comes up from the hot water, which started me on a new theory.

But, alas, after all my search I could not find out how the aphis got down there on the roots. In my dilemma a friend who was visiting me said, "When I return to Chicago I will send you the address of an aster specialist who may be able to help you." I wrote him and he very courteously replied with the following: "Get rid of the little red ant, and you will have no aphis." Then I recalled always seeing these ants at the roots, but did not blame them for the trouble, as my peony buds were all covered with them, and no harm done.

Digitized by Google

But *what a proposition—get rid of a garden full of ants.* But I knew what I was after now and went to work systematically. He stated the history of the trouble so clearly that I did not question it after my own experience. This aphis is called the *corn aphis,* also, as it attacks corn as well as asters and is doing untold damage to corn fields in some parts of the country.

This little nuisance has several names. It is also called the "ant cow" and is mothered and cared for by the ant from start to finish. The ant carries the aphis eggs down into their nests and cares for them through the winter. Early in the spring they bring the eggs to the surface so the warm sunshine will hatch them. Then they carry them and place them on the roots of corn, asters and some kinds of grasses and weeds. They do not eat but suck, and any poison applied to the roots will not kill them. They are great gormandizers and fill themselves so full there exudes from the body a honey dew, upon which the ant lives in the winter. The remedy is to inject beneath the plant, so as not to come in contact with the root, bisulphate of carbon or gasoline. Then close the hole, and they will smother. I watch for every ant nest and dose it with boiling water, from early spring until it freezes up, thus killing both ant and aphis before they attack the plant. I go over the whole garden in the fall and pull up every plant and weed, and examine them, and if either ant or aphis are found I scald them and burn the roots. Some would say, for all this trouble are the asters worth it? I say, yes!

Mr. Bubak: Do they attack garden vegetables?

Mrs. Odell: Not that I know of, but they do attack sweet corn and other plants that I have mentioned. They run right over everything else and into my aster bed. There are thousands of them, yes, millions would not be too many to say.

Mr. Underwood: Can't you plant enough sweet corn so that they will not bother the asters?

Mrs. Odell: I rather thought that might be an attraction, but I do not want to attract the bugs from the neighbors.

Mr. Husser: Has anybody ever used tobacco to prevent this root disease, or whatever it is?

Mrs. Odell: Yes, I did. I sent over to the factory and got whole loads of tobacco, and then I put half a cupful in the Bordeaux mixture. I poured it in the ground and packed the dirt around the roots, but it never fazed them. (Laughter.)

Mr. Underwood: What will kill them?

Mrs. Odell: The only thing I know of is boiling water. A florist said that was the way to get rid of them if it could be applied without injuring the plants. Of course it is heroic treatment, but at the same time it has got to be judicious treatment, you have got to keep it away from the roots. You have got to apply it in such a way that it does not reach the roots.

Digitized by Google

Mr. Johnson: Does not carbon bisulphide do the work?

Mrs. Odell: No, it does not. This florist also said it would not. He said he had corresponded with entomologists all over the United States, and I think he knows what he is talking about. He has certainly done some hard work along this line. He has been following this thing for five years.

Col. Burnap: Is this the same aphis there is on plants and box elder?

Mrs. Odell: No, it is a different shape. It is a very wise little creature. I never knew it so well before as I know it now. In fact, I do not think there was one hour in the day last summer when I was not out in the garden making a study of this little creature.

Mr. Wilkin: Have you tried sulphite of copper?

Mrs. Odell: Yes, I did.

City residence of Mrs. R. R. Odell, at 2836 Irving Ave. So., Minneapolis.

Mr. Wilkin: That is quite effective on the lawn in the way of destroying white grubs.

Mrs. Odell: These little insects cling closer to the roots and there is nothing you can put on externally that affects them at all.

Mr. Wilkin: You make a hole two or three feet down and that gas will kill all the insects it comes in contact with.

Mrs. Odell: I took a gasoline pump, and I put it clear down to the roots and squirted it down to kill the ants; sometimes it killed the plant, too, although it did kill the ants. I think the only thing to do is to head them off before they begin to do the damage. It is easier to head them off than to take the chances of having them destroy everything later. I came to the conclusion that it was worth the trouble to save the aster. I do not know how long this thing is going to last. It has been running for five years now and is growing worse.

Digitized by Google

Mr. Underwood: Is it not perhaps worse in rich, heavy soil?

Mrs. Odell: Yes, I understand so. I have part of the old Rupper farm, and it is delightful soil to work in. I have friends at Duluth who say they do not have this trouble, and so I concluded that heavy soil discouraged our work, and I imagine that makes a difference.

Mr. Mackintosh: I have read a bulletin by Dr. Forbes on the corn aphis. If you have not read that bulletin I would advise you to get it, because it is very interesting. He has spent eighteen years in the study of that particular feature. He went all over Indiana and Illinois through those great corn fields in the corn belt, over hundreds of acres of corn, and studied them in that way.

Mrs. Odell: I have spent nearly five.

Mr. Macintosh: If you want to get that bulletin you can get it from Dr. S. A. Forbes, Urbana, Illinois, the bulletin on the corn aphis.

Miss Ellison: Have you been troubled with aster yellow?

Mrs. Odell: That is exactly it. Some call it yellow, some call it something else, and some one calls it indigestion.

Mr. Clausen: I would like to say a few words in regard to this matter. It is a subject probably that is not so interesting to the majority of horticulturists as some other subjects would be. There are a great many lovers of flowers, and those are certainly interested in this subject. Some of us have sustained great losses through this very reason. Just a couple of years ago I heard of a florist in the state who planted thirty thousand asters and did not get a single flower, and this matter is something I have been very much interested in for the last five or six years. I have planted asters, thousands of them, and most years I can get asters when nobody else can, but I am afraid I cannot grow them very long if I must use the treatment the lady spoke about, hot water and gas. If any one could devise something to kill the pest, or even tell why asters die, it would be worth hundreds of thousands of dollars to the state of Minnesota.

Mr. Gardner: Shoot the lice before they lay their eggs. (Laughter.)

Mr. Bubak: That is just what the lady said, prevent the trouble in the first place.

Mr. Emmans: I think we could get rid of a great many of these insect troubles if we took the proper precaution in the preparation of the soil. I get much better results by spading my garden in the fall and leaving the ground rough; then in the spring I respade it, and I know I am not troubled so much with insects as some of those who leave the spading of their ground until spring.

Mr. Martin: I have found by placing coal ashes around the tree as a sort of a mulch it makes quite a difference in the number of insects that trouble the tree.

August and September are the months to plant pæonies. If you have old plants and wish to renew and divide them, this is the time of the year to do it. This advice applies also to that other garden favorite, the phlox, in variety. From this on they are the glory of the garden. The phlox particularly needs dividing every three or four years, or else it runs out.

Digitized by Google

Providing a Market for Fruit.

D. M. MITCHELL, OWATONNA.

Providing a market for fruit is of equal if not of more importance to the nurseryman than to the planter, for if a suitable and profitable market cannot he had, planting will decline, and the nurseryman will be producing trees and plants that he cannot profitably dispose of; but if a market can be found so the producer can dispose of his products profitably, the question of the nurseryman disposing of his goods to the planter will be an easy matter. Therefore, from the standpoint of the nurseryman, as well as from the standpoint of the planter, being both, I will endeavor to discuss this subject.

I have personal friends who are in the commission business whom I consider straightforward business men, so I do not wish any one to have the impression that I am making an endeavor to "knock" the commission business, but we have found this a very poor and unprofitable way of disposing of fruit. In my mind there is no question whatever but what the ideal way to market fruit and berries is through a co-operative system similar to the one at Minnetonka. This method of marketing is being practiced very extensively in the grape and peach growing districts of Michigan. When a paper like the Saturday Evening Post will devote a whole page to the marketing industries of fruits as marketed by the fruit growers along the lake districts of Michigan, there is no doubt whtever but what there is merit in their methods.

There is a question whether in communities where a small amount of fruit is produced this method would be successful, yet where an association of this kind would be desirable, the fruit growers, no matter how few, could band themselves together and work out ways and means for producing a better market. I know small fruit growers who will on Monday pick and put on the market about double the crates of berries that they will on Saturday or Tuesday, selling them through their local dealers, and Monday is a poor market day. In many instances it is necessary to drop the price to a considerable extent. The merchant will then sell berries by the crate at a price that the producer does not wish to compete with during the season. I think it is a mistake for the producer to put on the market, through the merchant, a big supply of berries or fruit of any kind, when probably cities and villages within from ten to twenty-five miles of his home town are wanting and needing the same article at a good, fair price. We have been very successful in marketing berries in outside towns. We find about how many our local dealers wish to handle each day, and then make arrangements with merchants in outside towns as to how many

Digitized by Google

crates they will handle a day, never promising more than we can do. Then if we see that we have more than we have standing orders for, we will call by 'phone our dealers at home, as well as in the outside places, and have easily disposed of from twenty-five to fifty cases of berries more than we thought we would have on that day's picking and at the same price.

The secret of the whole thing is to give people what they buy. It is better to throw away any fruit that is not perfect, or that is over-ripe, than to endeavor to work it off on anyone. In making arrangements to sell your berries or fruit, tell the merchant who is to handle it that it will reach him in first class condition—then be sure it does. Tell him your pickers will not put in any small or over-ripe fruit. Tell him the boxes or packages will be filled. Tell him it will be boxed, crated or barreled, as the case may be, in a workmanlike manner, and then *see to it that this is done.* After you make your first shipment to a party, call him up by 'phone that evening and ask him how he likes your goods. He will see that you have taken an interest in him, in what he gets and in what he pays for. You know it does not make so much difference to a merchant whether he pays a trifle more or less for an article if that article is a little superior to what he has been getting in other places.

We have found it a good plan to deliver packages direct to the express office, putting them on the trucks at the depot and having one of our men see that they are properly loaded in the express cars. It is very easy to spoil, or badly damage, a shipment of the finest berries by driving them over bad roads, or having them put in an express wagon and kept in the sun a considerable time before putting them in the express car.

We are talking strongly of organizing a fruit growers' association at Owatonna. The only question seems to be whether there are enough growers there to make it an object. Personally, I think the association plan is superior to anything I know of, but until the time comes that our fruit growing community is big enough to warrant an association we shall continue to market our fruit and berries along lines similar to what I have described.

CO-OPERATION BY FRUIT GROWERS.—One of the most helpful bulletins dealing with cooperation by fruit growers yet issued is one distributed by the University of Missouri Agricultural Experiment Station. It is Bulletin Number ninety-seven. Besides explaining why cooperation is necessary and the causes which have led to the failure of many cooperative associations, the bulletin gives a history of various successful organizations and publishes copies of their by-laws and regulations.

Digitized by Google

Promoting and Arranging Fruit Exhibits at the County Fair.

C. M. JENSON, SUPT. HORTICULTURE, FREEBORN CO. FAIR, ALBERT LEA.

The writer has had but little experience in getting the fruit together for the fair. The executive officers of our county fair are live horticulturists who never miss a chance to boost for a big fruit exhibit, and our local newspapers are always willing to help, so we generally manage to have a creditable display. We are also fortunate in having several well informed horticulturists among us, who are willing to show exhibitors which are the best specimens to exhibit, and if there is a variety brought in that the owner does not know the name of, there is generally some one who knows what it is.

Floral Hall at Freeborn County fair.

We have found that it is a good plan to have some one who is fairly well posted on fruits stationed either at the place where the entry tags are made out or at the exhibition building. In this way the varieties will be placed in their proper class and a lot of trouble avoided both by the exhibitors and the superintendent.

The Floral Hall at the Freeborn County fair grounds is a building fifty by one hundred feet and the fruit and flower exhibits occupy the center space the entire length of the building. On each side of the building there is a space ten feet wide that contains booths for the school exhibits, the grain and vegetable department, dairy and honey exhibit and the fancy work and cookery departments.

Our tables are made to hold seven rows of plates. They are about sixteen feet long and five feet wide. They are built in the form of steps or shelves, each row being raised four inches above the one below

Digitized by Google

it. The three rows on each side are made eight inches wide, while the row along the top is twelve inches in width. As the tables are made of rough lumber we cover them each year with a light green paper, which makes a nice background for the fruit. We cover the lower part of the tables with a cheap grade of muslin.

Fruit exhibit Freeborn County fair.

The tables used to be placed end to end, making a continuous row, but at the 1910 fair we saw that we would not have fruit enough to cover them all, so we took out some of them and placed the others crosswise in the space allotted to us. We liked that plan so well that we did the same this year. During the other years a good many people coming into the building would stop at the door, glance down the length of the row of tables and go out again. Now if they want to see displays to any advantage they must go through the entire length of the building and look at each table separately.

We used to use paper pie plates, such as the bakers use, to hold the fruit, but lately we have been using china plates. The plates are rented from some store, and, besides being neater in appearance and easier to handle, we find but little difference in the cost.

In arranging the different varieties of fruit, it looks best to place them so that the colors contrast. For example: Start with a highly colored variety like the Wealthy, next place a striped variety like Duchess or Charlamof, then a greenish variety like Patten's or Northwestern Greening, then some variety like Malinda or Longfield.

Digitized by Google

As a dividing line between each variety we use a piece of narrow tape. We also have neat cards printed, large enough to be easily read, bearing the names of different varieties of fruit and so mark each variety. That saves answering a lot of questions as to what the different varieties are.

If there are enough flowers on exhibition the top row of each table is covered by them. One table at least is always entirely covered by the floral exhibit.

C. M. Jenson, Albert Lea.

It may be of interest to you to know what results we have with our fruit department. As you all know, the season of 1910 was a poor fruit year, yet we had about 200 plates of fruit entered in competition for prizes. Last year we had 248 plates of apples and crabs in the single plate entries; 223 plates in different collections; thirty-one plates of seedling apples; sixteen plates of plums; nine plates of grapes; four plates of pears and one plate of strawberries—making 518 plates of fruit entered in competition. At least 125 different varieties of apples and crabs were shown in this list.

Besides this, the Wedge Nursery made a big display, as they do every year. Their collection this year consisted of about 150 plates of over 100 varieties.

Among others who make good displays each year are: P. Clausen, Christ Bethelson, H. F. Hanson, O. E. Dahlen, A. W. Massee and Chas. Ruble, all of whom, I think, are members of this society.

The virtues of the pæony are summed up by a writer in Vick's Magazine, as follows:

"No flowering plants capable of enduring our northern winters are more satisfactory than the pæonies. Massive, without being coarse, fragrant without being pungent, grand without being gaudy, various in form and color, beyond the possibility of being successfully superseded, they stand in the first rank of hardy flowers."

When applying nitrate to plants in active growth care should be taken not to scatter it on the leaves as it is very injurious to the foliage of many garden plants and vegetables with flat leaves.

Digitized by Google

Last Winter's Experience at White Bear Lake.

J. W. TAYLOR, ST. PAUL.

To show the different effects of a hard winter on apple trees in Minnesota in different localities, it is necessary to hear from different sections of the state. I notice in the July number of the Horticulturist that most of the trial stations report, "Very little damage to apple trees, but a small apple crop this year." If the trees were not damaged, why a very small apple crop? The truth is, the apple trees for a radius of twenty miles from White Bear were in many places injured and many killed. From careful inquiry and my own experience, the result is about as follows: Northwestern Greenings went to pieces in many orchards, also Patten's Greenings suffered. Duchess did not leaf out fully and have very few apples on. I have one tree now, July 15th, with many blossoms on, a very unusual thing, but all the Duchess are only about half leafed out, showing that buds were badly frozen. Our Wealthy showed no injury. The Minnetonkas came through nicely and are full of apples. All the Russian varieties are loaded with fruit. The trees not cultivated around stood the winter best. Also those which stood on high ground with good drainage did not suffer so much as those with wet feet.

Most of the trees we planted this spring died but sent up strong shoots from the roots, showing that only the tops were injured. The injury to new growth was very great in young stock. Plums all came through well and are full of fruit, except the Aitkin, which has very little. DeSoto and Stoddard are best. My Hansen plums not large enough to bear yet but did not mind the cold weather. Beta grapes killed back one-half. Janesville on same trellis did not suffer at all. Crabs loaded with fruit, especially the Virginia. Homer cherries no injury and fruited well. All our mulberries died but one. Shellbark hickory and butternuts not injured. Currants, raspberries and gooseberries overloaded with fruit. North Star currants as large as cherries and White Grape nearly as large. Both delicious for table use after standing with sugar on them over night.

Compass cherries not injured by frost, but some worm or insect has injured them this season, and many of the cherries have fallen off or dried up or rotted on the trees. Never have known them to suffer before from insect pest or fungous trouble or blight.

Many of our neighbors have tried to top-work their apple trees, but where they have cut off large limbs they have decayed and ruined the trees. Don't try to cut off large limbs on old trees.

Digitized by Google

Who can tell us of a pear which will bear the Minnesota climate? Every one would be delighted to grow such fruit. We are now succeeding with winter apples in the Milwaukee and Jewell's Winter, possibly we may raise pears some day. The magnificent show of fruit at the state fair last fall and at Spokane should make all Minnesota fruit growers happy.

Shrubs were not injured with us, not even spirea Van Houtii or flowering almond. Golden elder froze back, but came up more beautiful than ever from the roots. Herbaceous plants were not injured. Lilies, tulips, anchusa, valerian, veronica, Shasta daisies, gaillardia, peonies, campanula, achillea, foxgloves and hollyhocks are very fine this summer.

Concord, Delaware and Brighton grapes not injured, though very slightly covered. The conclusion is that as to apples we must graft on hardy crab stock. That trees must be planted where they are well drained and must not be cultivated to such an extent as to force late new growth, and if not protected by allowing sod to gather around them to protect their roots, should be mulched.

Constitutional Amendments for Reforestration.

BY GENERAL C. C. ANDREWS, SECRETARY OF MINNESOTA FORESTRY BOARD AND FORMERLY FORESTRY COMMISSIONER, ST. PAUL.

The proposed amendment to the constitution for a tax of one-fifteenth of a mill annually for reforestation received at the last state election, November, 1910, 100,168 votes, but lacked 55,010 votes of being adopted. The total number of votes cast at the election was 310,165.

As showing the comparative vote in the prairie and timber counties of the state, it is found that nineteen of the most southerly counties, comprising the two most southerly tiers of counties, gave in the aggregate 18,369 votes for the amendment. The total number of votes cast in those counties was 56,525, showing that 34 per cent of their votes were for the amendment. The aggregate vote given for the proposed amendment by seventeen of the timber and northern counties of the state was 18,229. The total number of votes cast in those counties was 47,047, showing that 38 per cent of their votes were for the amendment.

These figures show that there was a difference of only 4 per cent between the vote of the northern, or forest, counties of the state and the southern, or prairie, counties of the state.

Digitized by Google

It is interesting here to note that the proposed amendment received the largest proportional vote in Ramsey and St. Louis counties. The vote for it in St. Louis county was 6,784, being 41 per cent of the total vote of that county. The vote for the amendment in Ramsey county was 12,528, being 45 per cent of the total vote of that county. About the smallest vote which any county gave for it was that of Hennepin county, which gave 8,505 votes for the amendment out of a total vote of 43,903, being only 19 per cent of the total vote.

FOREST RESERVES OF OTHER STATES.

The state of New York has 1,645,088 of forest reserves, Pennsylvania has 973,226 acres of forest reserves. These states are annually increasing the area of their forest reserves by purchase.

Section of white pine tree, over three feet in diameter, breast high, on native place of Gen'l C. C. Andrews, one of the trees he helped care for as a boy. Grown during past seventy-five years.

The legislature of Wisconsin of 1911 passed an act appropriating $50,000 annually for five years as a forestry investment fund by which the state forester, under supervision of the State Board of Forestry, may purchase forest reserve lands. A legislative committee at each session, consisting of two appointed by the president of the senate and three by the speaker of the assembly, are to visit the forest reserves and to report to the legislature as to the purchases of land since the last regular session. Under this act, the state forester has purchased over 100,000 acres at an average cost of three dollars per acre. Including state lands which had been set aside, the forest reserves of Wisconsin have increased from 40,000 acres to 425,000 acres, and the state forester says that Wisconsin has only made a good start as the state must have a reserve of at least 1,500,000 acres in order to protect the headwaters of the most important rivers, aid in supplying the wood-using industries and protect the beauty of the northern lake region.

Digitized by Google

Including Itasca park, Minnesota has now only 34,000 acres of forest reserves. The state now holds about 2,500,000 acres of school and swamp lands, but the constitution fixes the system for their disposal and no part of them can be set apart for forestry purposes without an amendment to the constitution.

The lands which for various purposes were granted by congress to the state of Minnesota have amounted in all to a little over eight million acres. Of these lands the state, beginning in 1861, has granted to railroad companies very nearly three million acres of so-called swamp lands, permitting the companies, where there were deficiencies within the seven-mile limits, to make up the full amounts by selections elsewhere. Of the lands granted to the state or schools, internal improvements, etc., the state has, since 1862, sold 2,792,162.16 acres at an average price of $6.06 per acre, and now holds two and one-half million acres, of which one and one-half million acres are swamp lands. The process of selecting out the better portion of the state's lands having been in progress for fifty years, it would seem natural that of the two and one-half million acres now remaining, at least a million acres are what would be called refuse lands, better adapted for the production of timber than for agricultural purposes. These million acres, as soon as they can be selected, ought to be set apart for forestry purposes, and I recommend that a bill be introduced at the next regular session of the legislature for submitting to a popular vote an amendment to the constitution like the following:

PROPOSED CONSTITUTIONAL AMENDMENT.

"A commission consisting of the Governor, State Auditor and State Forester may set apart such of the school and other public lands of the state as are better adapted for the production of timber than for agriculture, as forest reserves, and the legislature may provide for the management of the same on forestry principles. The net revenue therefrom shall be used for the purposes for which the lands were granted to the state. The legislature may, from time to time, provide for the purchase of additional forest reserves, and for the disposition of the net revenue therefrom."

TILE DRAINS FOR THE ORCHARD.—Perhaps underdrains do more good to fruit orchards than anything else. Any farmer who has an apple orchard knows that the trees will grow and bear much better in dry places than in a soil that is too wet. I had a tile running between two rows of common red cherry trees, and these trees were about four times as large as others on land not drained, and the fruit was better.—Jas. Marshall, Wentworth Co., Ont.

Digitized by Google

Breeding Everbearing Strawberries.

HARLOW ROCKHILL, CONRAD, IA.

I commenced breeding strawberries about fifteen years ago, with the idea of getting them to fruit after the regular season. The French varieties were used to cross with our standard kinds. This work gave some promise but no results of economic value. All new varieties called "second croppers," or "everbearers," were purchased and tried out with no real success.

About this time Mr. Samuel Cooper, of New York, discovered a bud sport from the Bismarck, which fruited all summer and fall. It

Rockhill's "Progressive" everbearing strawberry.

also fruited on new runner plants soon after they were rooted to the ground. Great credit is due Mr. Cooper for the discovery of this plant, which was named Pan-American, but even greater credit is due him for the care he gave this plant and for placing it on the market.

Nature had taken a step in the evolution of the strawberry by causing it to fruit out of season, and in compensation she had taken away most of its ability to make plants by runners. This was a great drawback to its success, even for garden culture. A few plants reverted to the original type, which was strong evidence that the variety was a real bud sport, also that unless something was done to preserve this valuable character it might be lost.

Digitized by Google

I secured Pan-American and placed it in the garden with the French berry Louis Gauthier, which had been the best of its class to fruit out of season. In August and September these varieties both bloomed. The blossoms were carefully emasculated and the pollen exchanged, making reciprocal crosses. (All my hybridizing work is done by hand; I trust nothing to bees and wind.) The seeds from these fruits were sown in window boxes in February, and about 100 little plants were raised. These were transferred to the open field about the first of June. In August and September nearly one-fourth of these seedlings were fruiting. Many plants were rusty, many freak characters were also present. These plants were allowed to stand where they were, with whatever runner plants they had made, and fruit the next June.

A case of Rockhill's "Progressive"

At about the close of the fruiting season several varieties sent up second crop fruit buds, and these were all allowed to develop what they would. One nice, strong, clean plant, which had not fruited the first year, seemed to be better than the rest, and it continued to fruit heavily on the old and new plants from June to cold weather. After fruiting here three years it was sent out for trial. It made good in most parts of the United States. It was then named Americus and placed on the market. I believe it now stands at the head of the list of everbearing varieties.

Americus has now fruited seven years, and it is gratifying to note that not one plant has been found to revert or lose its everbearing character, and no signs of degeneration have appeared, the plants being as strong and thrifty as the original seedling. Mr. A. T. Goldsborough, whom I regard as the best authority in this country on Alpines and their hybrids, informs me that all such hybrids degenerate in five or six years.

I have made many combinations of blood of our leading varieties with the everbearers. Some of these give great promise. I have been

Digitized by Google

working eight years to combine the everbearing character with good plant-making ability. This I have secured in No. 16, a new seedling that has fruited here four years. Two thousand five hundred plants were sent out to different parts of the United States and Canada last spring for trial. The reports coming in are so encouraging that the variety will be placed on the market as soon as a sufficient stock of plants can be grown. In addition to its fine, thrifty plants, which are produced as freely as in our common varieties, it is a strong staminate, able to resist heat and drought to a remarkable degree. Fruit is of medium size, dark glossy red, with red flesh, very rich and sweet, a splendid keeper in the box or on the vines. We had seven matted rows of this twenty rods long, which were allowed to fruit last spring. It proved to be the earliest berry on the place, size about like the average Dunlap. We liked the quality better than Dunlap, and it turned out fully three times as many boxes of berries. It may not always do this. Nearly every blossom made a berry, while many of the Dunlap blossoms blighted. This variety will produce a nice crop of fruit in summer and fall on spring set plants and their runners. We have been highly rewarded by setting plants in fall on rich, moist land, set sixteen inches apart both ways and allowing them to fruit in the spring. Then when growth started, after the crop was off, all runners were cut and taken away, keeping the plants in hills the rest of the season. Some of these plants produced far over a quart of berries each from July 10th to cold weather.

It has long been my desire to make this everbearing character of real commercial importance, to produce a variety that could stand beside such creations as the Wealthy apple and fruits of its class, something that could be propagated so rapidly and cheaply that it could soon be placed in the hands of every person who loves strawberries and tills a garden. This is my conception of the real value of all plant-breeding.

I feel that the breeding of everbearing strawberrries is now on a sound foundation where the character will never be lost. I predict that the time will come when plants of this class will replace all the single cropping varieties that have been so popular, and justly so, in the past. Many fake varieties untested will be placed on the market, so buyers should be very careful what they buy and from whom they buy. But so many people with good, honest intentions are engaging in breeding these plants that it will be very strange if most valuable results are not secured.

Many house plants suffer from a neglect to water regularly. Some varieties that are kept in sunny windows require water every day.

Digitized by Google

My Way with Strawberries.

F. L. MARSH, CHAMPLIN.

This is simply a record of my own experience. It is also partly a record of failures. These may serve as warnings, the successes as encouragement. Where hearsay is mentioned, I do not ask anyone to accept it. I simply tell how it worked with us.

Being compelled to live in the village for business reasons instead of on the farm, as we would prefer, I let the farm for several years. I then had quite a nice lot of berries of various kinds. These were picked for a year or two, but soon went the way of all berries under similar circumstances, and we had little fruit for some years. This was an undesirable state of things, and we tired of it.

In the spring of 1907 we set 2,000 strawberry plants on two-fifths of an acre of sod, part seeded down the previous year, the rest old June-grass sod. I had read that damage from white grubs was common in sod ground, but I had so much confidence in this piece I decided to risk it. My farm is on the southwestern edge of the Mississippi flood plain, half of it being the sandy loam loess, the rest the gray till or timbered clay soil, common to much of Hennepin county. This piece is a second bench between the two, with my sidehill orchard rising to the south. We saw no damage from grubs. The next spring we took up 8,500 plants. From what were left we used all we could fresh, put up more than 125 quarts and sold $100 worth—and the pickers were not muzzled.

We set an acre on timothy sod, rather low, sandy loam. We used a moderate amount of stable manure. The strawberry is as gross a feeder as corn and does not object to coarse manure, on heavy land at least, so we did not compost and waste half for the sake of making the other half a little finer and more quickly available. Likely application the previous year would have been better, but we had none then. Again we saw no damage from grubs, though they nearly ruined a new bed on old ground adjoining ours and damaged our adjoining corn badly. This was on sod. I don't pretend to explain it.

In 1909 we got a fair crop from the new bed. We also fruited the old one again. I will not do that again unless in emergency, for it was twice the work to pick them, and they were small. The bed should have been renewed, but that is more work than to set a new one, and as we grow fodder corn or millet on the old bed after fruiting we get two crops in two years. That year we set an acre on black clay loam containing much humus. It was tough June-grass sod and

Digitized by Google

full of weed seeds, a legacy of the renters. We killed them—the weeds, not the renters. The same year we began working the rest of the farm, too.

Last season we fruited this bed. It was a fine stand, rather too thick. We kept them covered all through the hard frosts, and till several insisted the plants were spoiled. I thought they might as well be smothered as frozen. They were white when uncovered, but became green in a short time, and few were injured. I have uncovered late before, and while it can be overdone, I think there is much less danger than many suppose.

This bed bloomed and set profusely, and we looked for a big crop. When the drouth began to get severe I bought a rotary pump (we had the engine) and tried to put down drive wells. From previous experience I expected no trouble, but we struck quicksand and other well diggers' luck, and the hot sun cooked the berries meantime. On a quarter acre of new bed on sandy loam we got enough water to give it a good soaking and had some fruit. A second soaking would have given a fair crop. Had we prepared earlier for irrigating the clay land we could have done it with a third the water the sandy land took, and been some hundreds of dollars ahead. We saw no damage from the cold water. I think a little of it harmful, as the evaporation from the hot ground scalds the vines, but should not hesitate to flood them with cold water if I could not warm it. That would, of course, be better, but would take something of a reservoir, when we consider that an inch of rain means over 900 barrels to the acre, or five and one-half to the rod. These figures show the absurdity of carrying water by hand. We ran a stream on the small bed for twenty-four hours, as large as a one and one-fourth inch pipe would carry under strong pressure, but could hardly get a puddle on the sandy land.

I prefer the clay loam with plenty of humus and as low land as will be safe from danger of standing water. The clay grown berries look and taste well, and yield best; but they do not stand up nearly as well for shipping.

We like to have the new growth start strongly before taking up new plants. We cut back the roots at least one-third, keep the plants damp and set with a spade. Two cuts are made, the second one leaving a smooth bank of damp earth. A helper spreads the roots against the bank, earth is placed against them and pressed firmly with the foot, the helper then makes a dust mulch with a stroke of his fingers. We never water the plants and seldom lose any unless from cutworms.

I have not spring plowed because I believe in it by any means. When farming at a two and one-half mile range you can't always do

Digitized by Google

as you like. That spring, 1910, we had two acres of new bed prepared on what I considered the best land I had for berries. We started late in setting, on account of cold weather, and it soon got so dry that many of the plants failed to grow. Water might have saved them, but time failed to haul it.

We carried over the old bed, for the new one was making a very light stand. The drouth of 1910 was very severe with us. Many of the new plants had not rooted much. These winter-killed in the very dry soil. Here is another case where irrigation might have saved them. We covered them carefully, and the thin stand that came through looked vigorous and fine. We thought they would bloom and fruit profusely but were disappointed. The blossoms were few in number and seemed to lack vitality. There were a few fine berries, hardly enough to pay for picking. I could not understand it till I read what I should have known before, that the fruit stems are formed the preceding fall. Then I saw that the excessive drouth had prevented their formation.

Long and severe illness prevented setting a new bed last spring, so we are nearly out of the business, but we shall take it up again as soon as we get in shape, and I think one of the first things will be adequate facilities for irrigation.

I do not believe strawberries can be raised as easily as corn. A plant that must stand a Minnesota winter before it can give a crop is subject to some chances, and recognition of this fact will lead to more pains and better success. Judging from observation, unwise selection of ground is as common a cause of failure as is neglect. A suitable spot can be found on almost any farm, and large enough for family needs. That, I believe, is all the average farmer should attempt, and more than most of them do.

We like some kinds of wild hay better than straw for mulching, as it is free from seeds and lies on well. We used a lot of bean straw and like it. Wet weather had spoiled it for feeding.

We began with Warfield, Bederwood and Dunlap but soon discarded all but the Dunlap. It yields much better with us and ripens up well at the tip on our land.

In years of big production and low prices the man who irrigates will again win out, as his extra fine crop, the result of irrigaion, will realize the top prices. As business men know, the man with extra fine produce can sell more easily in the years of big production than the man with poor or only medium produce. Irrigation will often mean, in a crop like strawberries, the difference betwen success and failure, so that even with the most expensive system of irrigation the cost of installation would be paid for by one season's crop.

Digitized by Google

Sewing Strawberry Seed and After Care.

CLARENCE WEDGE, NURSERYMAN, ALBERT LEA.

Strawberry seed may be sown at any time during the fall and spring months. If sown in the fall it will come up very early in the spring, and the everbearing varieties will make plants that will fruit abundantly during the following summer if given rich soil and good cultivation.

For a hundred seeds, I should fill a shallow box, or flat, about eighteen inches square, with soil to the depth of about four inches, taken either from a rich garden plot that was very free from weed seed, or, if this was impossible, I should bake the soil thoroughly in order to destroy all weed seeds that might be in it, as the strawberry plant starts in a very small and feeble way and ought not to be compelled to rustle in competition with weeds that will germinate in one-fourth the time. The seeds may be sown in drills marked with small stakes, which would be especially desirable for those who are not familiar with the appearance of the little plant as it first comes out of the ground, or in baked earth a broadcast seeding would be equally satisfactory. The covering should be very slight, and if the soil is of a clayey nature, it would be best to cover with pure sand; in either case the covering should not be more than one-eighth of an inch deep.

I should then place over the soil a piece of burlap, carefully fitted to the inside of the box or flat, and bed the whole out in the garden, so that the surface of the soil in the flat will be about on the level with that in the garden; water thoroughly and cover with a mulch of clean hay or straw, held in place by some heavy material.

The mulch should be removed in early spring, and as soon as the frost is out of the ground the burlap should be lifted every day or two, to discover any germination in the seeds. On the first signs of germination, the burlap should be removed and the ground kept thoroughly moist until the plants have all made their appearance.

When the plants show the third or fourth leaf, they should be transplanted to the open where they are to stand, setting them about one foot apart, in rows about three feet apart, and giving them the usual care of newly set strawberry plants.

I do not know of any more interesting experiment that could be made at this time by our plant breeders, than with the new everbearing strawberry; the seed now being distributed by our society is from one of the most fruitful of all of Mr. Harlow Rockhill's varieties, which, with us, has been in absolutely continuous bearing during the season of 1912.

Digitized by Google

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by Mrs. E. W. Gould, 2644 Humboldt Avenue So., Minneapolis

Order your bulbs early. The earlier you send your order, the surer you will be to get the best bulbs and the varieties you wish—and buy *named varieties.*

September is the only month recommended by the American Peony Society for planting peonies.

Be prepared for frost by having plenty of material ready to cover flowers and enjoy them six weeks longer

Sow poppies outdoors, the last of September or first of October, for early bloom next spring.

Oriental poppies are best moved when they begin to grow after their rest during midsummer and will be much more apt to bloom than if moved in the spring.

"THE PEONY—QUEEN OF FLOWERS."

B. TERRELL HOYT, LANDSCAPE ARCHITECT, ST. PAUL.

Of all hardy perennial flowers, the peony is queen. Beginning with the first flowers in the early spring and until frost touches those in the late fall we have a rapid succession of perennial bloom, but when the peony arrives in early summer the others all stand back in proud submission. The peony stands alone.

No flower is any hardier. I have seen the buds freeze like icicles several times on stems two feet high and then go ahead and blossom, producing beautiful blooms. There is no other flower with so wide a range of color and variation. Surely the peony should find its way to every one's heart.

The principal and, in fact, only fault to be found with the peony is that the more one has and the larger the variety, the more he wants. In speaking of such varieties as the Baroness Schroeder, a friend of mine said, "You have to take off your hat every time you pass it." He said he thought it was one of the most exquisite peonies he had ever seen.

The Festiva Maxima is one of the finest whites in existence, some of them producing seven individual flowers to a stem and all out at the same time, the stem being three feet or better, while most of them have four or five blossoms. A fine stem of these beautiful white flowers, tinged with an edging of carmine on the tips of the center petals, is a bouquet in itself. These cannot be compared with the common washed out varieties of peonies too often grown.

There is the L'Esperence, a very beautiful dark pink variety, which is one of the earliest pinks to blossom and for that reason always brings a high price. It is a very heavy annual bloomer, a five-year-old plant producing several dozen fine flowers.

Another very beautiful pink is the Chicago Shell Pink. The Rubra Triumphans is a beautiful brilliant deep red, rather early, while the Rubra Grandiflora is a large late variety. The Queen Victoria is a fine early white, very globular, producing heavily. The Marie Le Moine is a very handsome ivory white variety, somewhat newer here and a great favorite; also usually a prize winner; very late.

There are hundreds of varieties, and by the proper selection of varieties a succession of bloom can be had from Decoration Day until after the Fourth of July, or from four to six weeks, depending somewhat upon the season.

When the finest varieties of peonies become better known, they will be planted much more freely. However, they should be planted in natural clusters. In fact, that is the only way any flowers are really effective. By placing the tall growing varieties in the background and the dwarf varieties in front, a very fine bank effect may be produced, and especially so if the peonies are backed up by higher shrubbery plantings.

We ought to stimulate enough interest in peonies here to have the National Peony Show here within a few years, and we can if every one plants plenty of peonies now so as to make a good showing when the time comes.

There should be prizes offered for more of the best standard varieties by the Minnesota State Horticultural Society now, so as to get more people acquainted with them, and such varieties as the Baroness Schroeder, Marie Le Moine and many others should be added. When people see the best they will drop the inferior varieties.

Where one only has room for a half dozen to a dozen peonies, it is folly to buy anything but large clumps of the best varieties, unless one wishes the small plants of the best varieties, which will necessitate waiting five or six years.

An acre of the best varieties of peonies is one of the best investments a man can make, considering the sale of the cut flowers and the increase of roots which is usually more than double. What other investment will accumulate that fast? The flowers alone will pay for the original plants in a year or two, and then the increase and profit begin, besides the pleasure one derives from them. Then, too, the peony is not troubled with insects or fungi and does not have to be dug up and taken down cellar every winter, which is a very important item to consider in growing flowers. From the fact that it will grow on any good, rich land, in partial shade and is as hardy as rhubarb, the peony ought to be in evidence on every home grounds in its proper location. Fall is by far the best time to plant as you are almost sure to get blossoms the first year. Many of our clumps produced from fifteen blossoms up just set last fall.

Digitized by Google

SECRETARY'S CORNER

A SEEDLING FLOWER—"I have a new seedling which I believe is a cross between the perennial larkspur and the blanket-flower, retaining colors of the latter yet having trumpet shaped petals, whereas the blanket-flower petals are all straight. It is a beautiful flower, and I shall plant seed from it this fall. Have any of the members anything like it?—G. J. De Mars, Fertile, Minn.

SEPTEMBER SUPPLEMENT.—The attention of our members is called particularly to the supplement accompanying this number of the monthly. The information asked for, when properly compiled, should be of great value to the fruit growers of the Northwest, and we hope that a large number of our members will furnish it at an early date. The fact that you have filled out and returned previous supplements before should have no bearing in deterring you from furnishing this information also. Working together in this way the society should be able to secure definite and practical results.

NEW PLUMS AT THE STATE FRUIT-BREEDING FARM.—A splendid showing of the new hybrid plums is now, August 28th, being made at the State Fair Breeding Farm. Several hundred varieties which have come through the winter unscathed are bearing in most cases a fine crop. A very full assortment of these fruits will be shown at the state fair next week, and we hope many of our members may have an opportunuity of seeing there what has already been accomplished at this farm. This we believe is only the beginning of results of large practical value which are to accrue to us from this enterprise.

A NEW SEEDLING RECORD.—The Plant Breeders' Auxiliary of the Minnesota State Horticultural Society is starting a system of record for the purpose of recording something of the history of new seedlings and crosses originating in the state. This record will include the name and address of the originator, a technical description of the variety, the place and date of origination, any information available as to the commercial value, use, etc. A start will be made at the state fair this year. It is hoped that those exhibiting new seedlings there will see to it that the attention of the society or its officers is called to them.

A VETERAN PRESIDENT.—Mr. A. W. McKinstry, of Faribault, president of this society during the second year of its life, that of 1867, was a caller at this office during the last month. Mr. McKinstry is now eighty-seven years of age, but notwithstanding this fact is still a regular attendant at his office in Faribault and in direct charge of the Faribault Republican, of which he has been editor and proprietor for a great many years. Few of our members have had the pleasure of meeting Mr. McKinstry, as he has not been for a long time a regular attendant at our meetings. We should enjoy much having him with us, but his advanced age, notwithstanding that he enjoys good health, necessarily keeps him at home. His interest in the Horticultural Society continues, as does our interest in him as our oldest living ex-president.

Digitized by Google

Digitized by Google

HORTICULTURAL HALL, MINNESOTA STATE FAIR, 1912. VIEW TAKEN FROM NORTHWEST CORNER OF THE HALL.

Digitized by Google

☞After reading this magazine, will you please pass it along to some friend who will appreciate it and whom you may perhaps interest to become a member of the society—at least he should derive benefit from its reading. By distributing in this way the twelve magazines received during the year 1911, at the beginning of the next year, upon renewing your membership in the society you will be entitled to receive postpaid a cloth bound volume containing all the magazines for 1911 and much other interesting matter, with a full index of all its contents, entitled "Trees, Fruits and Flowers of Minnesota," a handsome book for your library and invaluable for reference.

THE MINNESOTA HORTICULTURIST

Vol. 40. OCTOBER, 1912. No. 10.

Drouth Resistance in Trees Suitable for Shelter Belts.

C. B. WALDRON, PROF. OF HORTICULTURE, AGRICULTURAL COLLEGE, FARGO, N. D.

We have five experiment stations within the state where we are making considerable effort in growing different varieties of trees. The rainfall in the last two years was in the neighborhood of ten inches, and that gave some of our trees a pretty severe trial. We found the ability of the tree to resist drouth in the arid or semi-arid regions to depend upon two things: first, ability to do without moisture; and, second, ability to get moisture. The second point is probably more important than the first. It is something like a man's income, his net income must be subtracted from what he earns. Some men get a good deal and spend a good deal, and some learn that they cannot afford to spend much. Some trees get a good deal of moisture and have a way of spending it too, while others do not get a good deal and have also a very poor facility for obtaining moisture from the soil. Among this latter class perhaps we can first place the Norway spruce, which you know is hardy and does not require much moisture but has poor ability to get moisture. It is an interesting experiment to watch the struggle of a number of different varieties of trees. We found where the Norway spruce came into competition with the willow and soft maple, for instance, it had given up entirely. The soil is rendered more dry by trees like the willow and the soft maple, while the Norway spruce does not require much moisture and has not got the ability to get the moisture it needs.

In regard to drouth resisting trees, we could divide those into two general classes by adding to what I have given. First, trees with a deep rooting system, like the black walnut. We found a year ago when there was plenty of moisture in the subsoil the black walnut resisted drouth better than any tree we had. We had five hundred growing at

Digitized by Google

the station, and the average growth of the trees was about two feet. That is very remarkable because we usually think of a black walnut as requiring a moist soil. This year also the black walnut made a growth of two feet. It shows conclusively that the black walnut can be classed as a drouth resisting tree because the roots run deep in the soil.

The willow is one of the best drouth resisting trees we have here in our belt. The willow does exceedingly well in a soil that is dry. We have demonstrated that at our stations, some of which are established in the most trying situations so far as tree growth is concerned.

Another tree that has great capacity for resisting drouth is the hackberry. That requires about as much moisture as the elm normally, but still where we have it growing in the most trying conditions we found it made a growth as high as three and a half feet a year, while the elm and soft maple, which are faster growing trees, did not make as good a growth, and the reason why the hackberry is a drouth resisting tree is because it has the capacity to make roots fast.

The tree which has the poorest capacity for withstanding drouth and making a growth is the white birch. In 1909 our white birches made an average growth of three feet, trees six and seven years old, and I measured a growth of actually over four feet in the top of a white birch tree. In the dry year following the growth did not reach more than three inches, a growth in inches in a dry season as great as it made in feet in a moist season. The birch has a poor capacity for making roots, and people who try to transplant it know the difficulty about that.

We have trees that come from the west that seem to stand our conditions much better than trees that come from the east. That is to say, the Black Hills spruce, the Colorado blue spruce, the bull pine and our own cedar do not seem to notice the drouth at all. Those trees that come from the west and have great drouth resisting properties are naturally suited to our conditions. Also those trees which come from the east and which have great capacity for developing roots, like the willows and the poplars, resist drouth well. On the other hand, those trees which root near the surface do not resist drouth so well. For instance, the box elder. I have forgotten the exact measurement, but it made only about one-half the growth in the last year and this year that it did the year before. It seems materially affected by drouth, although it has some capacity for making roots, and it requires a good deal of moisture. I think I would place trees in their order as drouth resisting, the western evergreens, first, perhaps, the Colorado blue spruce, then the Black Hills spruce, and then the bull pine. I think I

Digitized by Google

would place the common grey willow in the drouth resisting class, because it is a tree that does well in the semi-arid regions, then the black walnut, then the hackberry, the soft maple, the elm, the box elder, and lastly the birch, which makes no growth at all during a dry season, for the reason I have mentioned.

Mr. Sahler: How about the cottonwood?

Prof. Waldron: If the cottonwood has lots of room it is not affected, but where it is crowded and becomes ten to twelve years old it will die in winter. Where single specimens of cottonwood are planted they will root well and will resist drouth well.

Mr. Elliot: Can you tell us anything about the drouth resisting qualities of fruit trees?

Prof. Waldron: We keep them in a separate classification. The Compass cherry is recommended for its drouth resisting conditions. It made a growth of three feet and up to as high as four feet in a dry year.

Mr. Gardner: The Norway spruce will not succumb to drouth where they are separate.

Prof. Waldron: Ours were planted rather closely. We planted our Norway spruce, four rows, about four hundred feet long, and the trees made a spread of about six feet and grew about twenty-five feet in height, but the last year over half of them died. Wherever they grew in proximity to other trees they died out entirely. Our bull pine made a windbreak a half a mile long and made a foot of growth.

Judge Moyer: How about the green ash?

Prof. Waldron: That is the tree for you. At one of our stations we have a soil which gives trees a very severe trial—the subsoil is of a gravelly nature, and it takes a tree with a good deal of nerve to stick it out in that soil. There are the green ash, the bull pine and the Colorado blue spruce. Those three trees have existed there for nine years, and we have concluded not to try much of anything else except the willow. That will grow on gravelly knolls. We had a contest between the willow and elm planted twelve feet apart, and at the end of the year we discovered the elm was not making a satisfactory growth. The superintendent decided to cultivate about the elm, and he found that the elm roots were undeveloped, while the willow roots had come clear across the twelve foot space and were robbing the elm roots. I put a row of bull pine between, and they are doing better. The willow will find moisture if there is any on a half section of land.

Mr. Frank Brown: How about the jack pine?

Prof. Waldron: They make a good growth in dry weather. They require even less moisture than the bull pine. I do not suppose they have so deep a rooting system, but they made a good growth during the dry season.

Judge Moyer: How does the golden willow succeed?

Prof. Waldron: That does very well where we use it for hedges. I do not think it is as resistant as the grey willow and not as perfect a rooter as the grey willow, but you would be surprised at the way in which they hold their own in extremely dry weather.

Digitized by Google

Mr. Gardner: Have you tried any pin oak?

Prof. Waldron: Yes, I have them growing. They stand drouth well, like the black walnut about, on account of their deep rooting system. If you had a very dry soil and had the subsoil dried out thoroughly, you would have trouble with the black walnut, but generally the soil is not affected.

Mr. Ludlow: Is there any difference between the white willow and the grey willow?

Prof. Waldron: There is no difference. The willow has the widest possible range, growing all over Europe and Asia.

Mrs. Jennie Stager: Can the black walnut be moved and live after it gets to be six to eight years old?

Prof. Waldron: I took a tree out of the garden, where a nut had been planted, that was eight years old. It is a good plan to cut the tap root and then move them the following year.

Mr. Husser: Where would you get black walnut seed?

Prof. Waldron: I traced it to Blue Earth county Minnesota, and part of it was obtained from South Dakota. Mr. Whiting has an old walnut tree which came from Colorado originally.

Prof. Hansen: Is it native out there?

Prof. Waldron: I don't know whether it is or not, I have been all over Colorado, and I have never seen a black walnut tree grow there.

Mr. Busse: Have you ever tried mulching to resist drouth affecting trees?

Prof. Waldron: We have places where we cannot grow trees very well without mulching. At Edgerly we have got to mulch. I find on measuring the growth that mulched trees get full as good a growth as those not mulched and provided with continuous cultivation. Where the ground is dry and hard they have to be mulched. Last year we got a growth on some of our green ash trees of three feet in that dry soil. When we went through with our special train we had a tree car fitted up. Some of our people raised the objection that the green ash grew too slowly, and our gardener went out to the experiment station that morning and cut a few green ash and put them in the car and then asked them what objection they had to those trees. The committee asked where he had obtained them, and we told them we got them about a mile out. The committee thought they had come from some place in the east, but they were grown right there at Dickinson in that dry soil, but we had kept them mulched.

It is one thing to keep apples merely from rotting and another thing to preserve them in that crisp, juicy condition which adds so much to their value and encourages large consumption. Some varieties may be preserved in ordinary storage as long as it is desirable to keep them, but most of the standard varieties could be delivered to market in better condition and with less loss from decay after picking. I want to emphasize this point. It is of the highest importance that there should be as little delay as possible. A delay of one week between picking and storing will shorten the life of the apple even in cold storage by many weeks. This applies particularly to the early or quick ripening varieties.

Digitized by Google

Cultivation of Native Ornamental Plants.

MISS ELOISE BUTLER, CURATOR OF THE WILD BOTANIC GARDEN, GLENWOOD PARK, MINNEAPOLIS.

In planning a home, comfort, utility and the essentials for healthful living—light, air, drainage—must first be provided for; but all these can be obtained without the sacrifice of beauty, about "the best thing God invented." To observe the principles of good taste does not entail greater expense but merely forethought. The laws of artistry are well known to lovers of the beautiful. Why cannot they be followed by everyone, and why should anything ugly be tolerated? Every home should be a joy to the eye, every block a harmonious picture, every street a vista of enchantment, the horizon framing a scene of splendor. To make this ideal possible, a duly qualified art commission should be appointed to surpervise the buildings of the city, and all owners of adjacent grounds should consult one another and submit their plans to this commission for approval. As it is, everything is done at hap-hazard, and harmonious results are achieved, if at all, by happy accident.

A house should be adapted to the site and the environment, harmonizing in color and mode of architecture with the neighboring buildings. The living rooms should be so arranged as to command the most beautiful prospects, including, if possible, sunrise and sunset. But what has all this to do with the cultivation of plants? Everything, for the decorative features of one's grounds should not be meaningless tags, but a part of an integral whole.

Strive to retain the natural features of the site, for you can seldom improve upon nature. In the clearing of land for building, notable plants are often destroyed that cannot be restored for a price. The best intentioned efforts in grading and planting have the taint of artificiality and are stiff and commonplace compared with the inimitable graces that nature, the greatest landscape architect, has for so many years perfected. Instead of staling the infinite variety of nature by reducing the land to a monotonous level, we should cherish the native plants, boulders and outcropping ledges—the harbors of ferns, mosses and lichens—and irregularities of surface that afford differences in light, exposure and moisture, and thus make possible a greater variety of vegetation.

Unfortunately, most people cannot begin anew, but can improve only or make the best of what they have. It is not necessary to call to your attention certain principles of planting, too often disregarded: that trees and shrubbery should harmonize with the lines of architecture and connect the buildings with the ground, and be confined in the main,

Digitized by Google

especially in restricted areas, to the vicinity of the walls of the buildings and to the borders of lawns and paths. Shrubs and flower beds otherwise placed have a patchy effect and dwarf the space. If privacy were no object, spaciousness would be best attained by treating adjacent lawns as one. Plants should also be selected with reference to color, form, size, beauty of foliage, flower or fruit, for succession of bloom and all-the-year-around effects—for winter is not cheerless and devoid of color. A landscape with the delicate tracery of deciduous trees against the sky, gleaming with the red, green and gold stems of shrubs

Cow Parsnip, Heracleum lanatum.

hung with fruit ranging from white to blue, red and purplish black, set off by snow and the dark green foliage of evergreens, I, for one, would not exchange for perpetually blooming roses.

Avoid, above all, imported plants of unusual color, like the copper beech and weeping trees, or plants trimmed into formal or fantastic shapes. In general, native species should be used. For plants torn from their natural setting may strike a false note in the landscape. There are many plants just as effective as the cultivated canna, castor bean, crimson rambler, fall hydrangea, golden glow, admirable in themselves, that now pall upon the taste by reason of monotonous reiteration.

Digitized by Google

Outside of the city there is no excuse for ugliness. If you own a tract of land in the country that you can afford to keep for a pleasure ground, you have a source of perennial pleasure. The most attractive adjuncts of a place are always the native ones. You will never go astray if you endeavor to maintain the indigenous flora of brook, pond and lakeside, bog, meadow, rocky slope, wood and prairie, since each is beautiful and peculiar to itself, and exemplifies unity in variety, an essential of good art. Your favorite plants can be introduced and will flourish if properly placed. You will learn what to transplant and where by observing the conditions under which the species grow most luxuriantly. Many plants, however, can adapt themselves, within certain limits, to different life-relations. You can often better the conditions, for seeds scattered by accident may have germinated where the wind, or other agent of dispersal, listeth. Besides giving your transplants the environment they prefer, you can enrich the soil, discourage competition by thinning out and improve the breed, or produce new varieties, by grafting or cross-pollination.

Wild cucumber.

It would be impossible to enumerate in this paper the native plants desirable for cultivation, so great is their number. I have prepared, therefore, for publication in your official periodical, a lists to which you can refer, if interested in the subject.

In regard to trees, much depends upon the space available. They should be selected with an eye to scenic effects and for durability. Keeping these two points in mind, since each species has individual merit, one will make no mistake if he indulges his preferences in habit of growth, foliage, flower, fruit or autumnal coloring. Evergreens are admirable in winter but must be placed discreetly to avoid somberness. Oaks, elms, hackberry, basswood, hard maple are all splendid

Digitized by Google

trees. The red maple (Acer rubrum), although a soft wood species, well repays cultivation. It glows like a torch in the spring with its vivid flowers and fruits, and turns a gorgeous red even before frosts set in. Another small tree, black alder, or holly, (Ilex verticillata) is extremely pleasing by reason of its wealth of red berries.

As for small trees or notable shrubs, their name is legion: the wild crab, plum, cherry and Juneberry, decorative in flower and in fruit and of culinary value as well; the waahoo, a veritable burning bush; the wild roses and dogwoods, whose bright stems warm the snow and display together the national colors in their fruit; and the viburnums, among them the high bush cranberry with its large flower clusters made up of blossoms that produce the scarlet, acid drupes, rimmed by a row of larger, neutral blooms. Man has transformed these clusters entirely into neutral flowers, making the snowball, uninteresting and pompous with its big heads, that are of no use to him or bird, and of much less beauty than those of the wilding.

In plant decoration vines are especially important. Picturesque and graceful, they disguise faults of architecture, cover bare, unsightly places, relieve stiff formality, and furnish shelter—and often food—for birds. Room can always be found for vines on wall, fence or screen; and if one is not over-precise or neat he will leave here and there an upstanding trunk of a dead tree to support them and for homes for wren or bluebird—delightful songsters with endearing ways. As one recalls the luxuriant growth of the wild grape, the resplendent autumnal coloring of the Virginia creeper, the persistent, brilliant berries of the bittersweet, the profuse white flowers and grayish, fluffy plumes of the clematis, he will want them all.

For the most part, perennial herbs are to be preferred to annuals, for when once established they will require but little care. Some annuals, however, will seed themselves. Of especial value is the sensitive, or partridge, pea (Cassia Chamaechrista). The foliage is refined, the flowers large, of bright, clear yellow with brown centers. Cleome serrulata, another annual—although the odor of the foliage is somewhat rank—is sure to please, because it attains a large growth and produces for more than a fortnight a profusion of pink, feathery blooms.

Your choice of herbaceous plants should be regulated by the light exposures, for you can change the soil and provide the needed moisture if you care to take the trouble. On the north side of buildings, or wherever there is shade, ferns can be planted. They will take the place of the early flowers, which are chiefly shade plants. All are delightful, from the tall, lush osmundas to the tiny crevice, or rock, ferns, with their exquisitely cut foliage and their cool, restful tones of green. With herbs on small grounds, a succession of bloom must also be

Digitized by Google

planned for. On a large estate, where conditions are varied, this point does not need to be considered. Nature will attend to it.

By all means leave some grasses and sedges unmown. They soften hard edges, and nothing is lovelier in winter than their waving plumes, transfigured at times with hoar frost, ice crystals or snow.

The early flowers are usually delicately tinted—far otherwise are those of mid and late summer. Then, nature uses blues and white to tone down the garish reds and yellows, and to harmonize discordant colors. White flowers in succession, of all heights and adapted to different situations, can easily be obtained. Among them—to mention only a few—are the Canadian anemone, the filmy northern bedstraw,

Thoroughwort (Boneset) Eupatorium.

starry campions, larkspur with ethereal wands, the stately late meadow rue, the late-blooming eupatorium, and the huge cow parsnip (Heracleum lanatum).

For other perennial herbs you can consult the printed list. I would mention particularly our native phloxes, blue and pink—social plants, excellent for massing; the pale-leaved, bright-flowered aster sericeus, and the better known New England aster, of especial value on account of its height and large, richly-colored flowers; the cardinal flower, of incomparable hue; the wondrous orchids; our glorious lilies; the unique closed gentians; the wild sunflowers; the tall, profusely flowered sneezeweed; and the great St. John's-wort, whose large blossoms are as lovely as yellow roses by reason of their innumerable stamens.

To procure these plants I should deplore a reckless despoliation of the wilderness. Many of them can be found in neglected places, or where it is the intention to till the soil, or to lay out roads in the march of improvements. They are also cultivated by a number of nurserymen and florists, who offer them for sale.

Digitized by Google

List of Native Ornamental Plants.

Prepared by Miss Eloise Butler, Curator of Wild Botanic Garden, Glenwood Park, Minneapolis.

Named in accordance with the 7th edition of Gray's Botany.

(Note. Species labeled *dioecious* bear staminate and pistillate flowers on different individuals. To insure fertilization a staminate plant should be placed in a group of pistillate plants.)

TREES—All our deciduous hardwood trees, and of the soft woods, the swamp maple (Acer rubrum), on account of its brilliancy in flower, fruit and autumnal coloring,

Black Alder (Ilix verticillata, dioecious) has a profusion of red berries.

Ironwood or Hop Hornbeam (Ostrya virginiana) has decorative, hop-like fruit.

Basswood (Tilia americana), attractive flowers and fruit.

Alder (Alnus incana), graceful flower clusters, decorative winter cones and buds. It prefers low land.

All our EVERGREENS—

White Pine (Pinus strobus), the best of its genus.

White Spruce (Picea canadensis), at its best, surpassed by none.

Red Cedar (Juniperus virginiana) (dioecious), fine for columnar effects.

Prostrate Juniper (Juniper horizontalis) (dioecious) forms large, dense mats of perpetual green. The blue, berry-like fruits of the junipers are decorative.

Ground Hemlock or Yew (Taxus canadensis) (dioecious), a low evergreen bush with bright red berries. This thrives best near water.

SHRUBS—

White flowers and white fruits—

Dogwoods (Cornus asperifolia, C. Baileyi, C. stolonifera, C. paniculata),

Snowberry (Symphoriocarpus), a low shrub.

White flowers and red fruits—

High-bush Cranberry (Viburnum Opulus var. americanum).

Red-berried Elder (Sambucus racemosa),

Juneberry or Shadbush (Amelanchier), four species.

Hawthorn (Crataegus), several species.

Mountain Ash (Pyrus americana and P. sitchensis),

Chokeberry (Pyrus arbutifolia), a low shrub.

Choke Cherry (Prunus virginiana),

Bird Cherry (Prunus pennsylvanica),

Sand Cherry (Prunus pumila), a prostrate shrub.

Western Plum (Prunus besseyi), a low shrub.

Wild Plum (Prunus nigra and P. americana).

Red fruits and inconspicuous flowers—

Waahoo or Burning Bush (Euonymus atropurpureus), highly decorative.

Bearberry (Arctostaphylos uva-ursi), a prostrate trailing shrub.

Coral-berry (Symphoricarpus orbiculatus).

White flowers, large bladdery fruit—

Bladder Nut (Staphylea trifolia).

White flowers, inconspicuous fruit—

Meadow-sweet

Nine-bark Spiraea salicifolia, a low shrub,

Nine-bark (Physocarpus opulifolius),

Leather Leaf (Chamaedaphne calyculata), a low shrub, preferring low land.

New Jersey Tea (Ceanothus americanus), a low shrub with panicles of feathery white flowers.

Red or pink flowers and red fruit—

Wild Rose, four species (Rosa blanda, acicularia, pratincola, Woodsii, carolina).

Wild Crab Apple (Malus loensis), incomparable in flower and in decorative fruit.

Cranberries (Vaccinium macrocarpon & oxycoccus), trailing bog plant.

Pink flowers and inconspicuous fruit—

Hardback or Steeple Bush (Spiraea tomentosa), a low shrub.

Twin-flower (Linnaea borealis var. americana), a trailing evergreen, with small leaves and fragrant flowers.

Blue fruit and white flowers—

Dogwood (Cornus circinata, C. amomum, C. alternifolia),

Dockmackie (Viburnum acerifolium),

Arrow-wood (Viburnum dentatum),

Blueberry (Vaccinium canadensis & pennsylvanicum), low shrubs.

Vaccineum stamineum & corymbosum, high bushes, the latter a swamp plant, decorative in flower and in fruit. The foliage of the blueberries is vivid red in autumn.

Blue fruit, yellow flowers—Honeysuckle (Lonicera coerulea).

Bluish purple flowers—False Indigo (Amorpha fruticosa).

Yellow flowers, red fruit—Fly Honeysuckle (Lonicera canadensis),

Swamp Fly Honeysuckle (Lonicera oblongifolia).

Leatherwood (Dirca palustris), flowers early in the spring before the leaves appear.

Yellow flowers, inconspicuous fruit—

Bush Honeysuckle (Diervilla lonicera), a low shrub.

Shrubby Cinquefoil (Potentilla fruticosa),

Shrubby St. John'swort (Hypericum prolificum),

Witch Hazel (Hamamelis virginiana), flowers before leafing, interesting fruit with explosive pods.

Digitized by Google

Yellow fruit, white flowers—Choke Cherry (var. Prunus virginiana),
Deerberry (Vaccinium stamineum).
Greenish yellow flowers, inconspicuous fruit—
Milk Vetch (Astragalus canadensis).
Blackish fruit, white flowers—
Sheepberry (Viburnum lentago).
Downy Arrow-wood (Viburnum pubescens),
Withe-rod (Viburnum cassinoides),
Purple-berried Elder (Sambucus canadensis),
Chokeberry (Pyrus melanocarpus),
Black fruit, yellowish flowers—Black Currant (Ribes floridum),
Black fruit, inconspicuous flowers—
Wild Buckthorn (Rhamnus alnifolia).
Silvery foliage, red fruit—Buffalo Berry (Shepherdia argentea).
Silvery foliage, silvery fruit—
Silverberry (Elaeagnus argentea).
Inconspicuous flowers, with large clusters of decorative, wafer-like fruit—
Hop Tree (otelea trifoliata).

WOODY VINES—

Bittersweet (Celastrus scandens) (dioecious), a rapid twiner with handsome red berries.

Virginia Creeper or Woodbine (Psedera quinquefolia), with dark purple fruit and vivid autumnal foliage.

Wild Grape (Vitis vulpina) (dioecious), a large vine with fragrant flowers, decorative leaves and fruit.

Wild Clematis (Clematis virginiana), a rapid grower, with a profusion of small white flowers and decorative, feathery fruit.

Purple-flowered Wild Clematis (Clematis verticillaris).

Indian Pipe (Aristolochia macrophylla), with large, showy leaves. Will flourish in shade.

Smilax or Greenbriar (Smilax rotundifolia & S. hispida), with glossy leaves and large bunches of dark blue berries.

Honeysuckle (Lonicera dioica), a low vine with red flowers and light red berries.

HERBACEOUS VINES—

Wild Yam (Dioscorea villosa) (dioecious), with graceful clusters of triangular, winged fruit.

Moonseed (Menispermum canadensis), with large leaves and grapelike, inedible fruit.

Ground Nut (apios tuberosa), with drooping clusters of pretty, mauve colored flowers.

SHADE PLANTS

Ferns—
Ostrich Fern (Onoclea Struthiopteris)
Interrupted Fern (Osmunda Claytoniana)
Royal Fern (Osmunda regalis)
Cinnamon Fern (Osmunda cinnamomea), a bog fern.
Lady Fern (Asplenium filix-femina)
Narrow-leaved Spleenwort (Asplenium angustifolium)
Silvery Spleenwort (Asplenium acrostichoides)
Male Fern (Aspidium filix-mas)
Goldie's Fern (Aspidium goldianum)
Evergreen Wood Fern (Aspidium marginale), prefers rocky soil.
Christmas Fern (Polystichum acrostichoides)
Braun's Holly Fern (Polystichium Braunii)
Crested Wood Fern (Aspidium cristatum), prefers moist shade.
Spinulose Wood Fern (Aspidium spinulosum), moist shade.
Maiden hair (Adiantum pedatum)
Oak Fern (Phegopteris dryopteris)
Beech Fern (Phegopteris hexagenoptera)
Beech Fern (Phegopteris polypodioides)
Bladder Fern (Cystopteris bulbifera)
Bladder Fern (Cystopteris fragilis)
Cliff Brake (Pellaea atropurpurea), prefers limestone cliffs.

EARLY FLOWERING HERBS (chiefly shade plants).

White flowers—
Trillium grandiflorum, red fruit, petals turn pink in age.
Nodding Trillium (T. cernuum)
Early dwarf Trillium (Trillium nivale)
Painted Trillium (T. undulatum), petals pink striped.
Dogtooth Violet or Adder's Tongue (Erythronium albidum)
Bloodroot (Sanguinaria canadensis)
Dutchman's Breeches (Dicentra cucullaria), flesh color.
Squirrel Corn (Dicentra canadensis).
Red Baneberry (Actaea rubra), with red berries.
White Baneberry (Actaea alba), with white berries.
Canada Violet (Viola canadensis), petals blotched with pink and yellow; fragrant and a free bloomer.
Mandrake or May Apple (Podophyllum peltatum), with large red fruit.
Wild Calla (Calla palustris), an aquatic.
False Spikenard (Smilacina racemosa)
Star-flowered Smilacina (Smilacina stellata)

Digitized by Google

Wild Lily of the Valley (Maianthemum canadensis), this and the smilacinas have red berries.
White Lady's Slipper (Cypripedium candidum)
Grove Anemone (Anemone quinquefolia), pink in bud.
False Rue Anemone (Isopyrum biternatum)
Early Saxifrage (Saxifrage virginiensis), grows on ledges.
Two-leaved miterwert (Mitella diphylla), leaves evergreen.
Foam Flower (Tiarella cordifolia)
White Fringed Orchid (Habenaria blepharigiottis)
Shin Leaf (Pyrola elliptica)
False Wintergreen (Pyrola americana)
Wild Buckbean (menyanthyes trifoliata), a bog plant,
Spikenard (Aralia racemosa), a large plant, blossoms in July.

Blue or purple flowers—
Sharp-lobed Hepatica (Hepatica acutiloba)
Round-lobed Hepatica (Hepatica triloba), the leaves of the hepaticas are evergreen.
Blue Violets (Viola papilionacea, palmata, sororia, cuculiata).
Shooting Star (Dodecathon meadia).
Greek valerian (Polemonium reptans)
American Vetch (Vicia americana)
Phlox divaricata
Virginian Cowslip (Mertensia paniculata)
Virginian Waterleaf (Hydrophyllum virginicum)
Carolina Anemone (Anemone caroliniana)

Red or pink flowers—
Showy Orchis (Orchis spectabilis)
Showy Lady's Slipper (Cypripedium hirsutum)
Stemless Lady's Slipper (Cypripedium acaule)
Rue Anemone (Anemonella thalictroides)
Wild Columbine (Aquilegia canadensis), scarlet and yellow.
Trillium erectum, purplish red.
Spring Beauty (Claytonia virginica), prefers low land
Vetchling (Lathyrus venosus)
Wood Sorrel (Oxalis acetoselia).
Wild Ginger (Asarum canadensis), a reddish purple.
Fringed Polygala (P. paucifolia)
Wild Geranium (G. maculatum)
Wild Phlox (P. pilosa and P. maculata)
Grass Pink (Calopogon pulchellus), a bog plant.
Rose Pogonia (P. ophioglossoides), a bog plant.
Purple Fringed Orchis (Habenaria psychodes), meadows
Painted Cup (Castillica coccinea), meadows
Marsh Cinquefoil (Potentilla palustris), purplish red; wet meadows.
Wood Lily (Lilium philadelphicum)
Pitcher Plant (Sarracenia purpurea), purplish red; bogs.

Yellow or orange flowers—
Dogtooth Violet or Adder's Tongue (Erythronium americanum)
Bellwort (Uvularia grandiflora)
Sessile-leaved Bellwort (Uvularia sessilifolia).
Clintonia borealis, a lily with blue berries
Yellow Lady's Slipper (Cypripedium pubescens & C. parviflorum)
Golden Corydal (Corydalis aurea)
Marsh Marigold (Caltha palustris), bogs
Yellow Water Crowfeet (Ranunculus delphinifolius (aquatic)
Yellow Violet (Viola pubescens)
Zygadene (Zygadenus chloranthus)

Arums—
Jack-in-the-pulpit (Arisaema triphyllum) (usually dioecious)
Green Dragon (Arisaema Dracontium), low grounds.

FLOWERING HERBS THAT WILL GROW IN FULL SUN.

White flowers, dry or sandy soil—
Northern Bedstraw (Galium boreale), grows also in meadows
White Bladder Campion (Silene nivea)
White Beardtongue (Penstemon albidus)
White Larkspur (Delphinium Penardi), rocky banks
White Evening Primrose (Oenothera pallida)
Flowering Spurge (Euphorbia corollata)
Snow-on-the-Mountain (Euphorbia marginata)
White Prairie Clover (Petalostemum candidum)
Aster ericoides
Aster multiflorus

White flowers, meadow plants—
Cow Parsnip (Heracleum lanatum), a large plant
Boltonia asteroides
Anemone canadense
Late Meadow Rue (Thalictrum polyganum)
Turtlehead (Chelone glabra)
Aster paniculatus
White Snakefoot (Eupatorium urticaefolium)

Digitized by Google

Grass of Parnassus (Parnassia caroliniana)
Stitchwort (Stellaria longifolia)
False Asphodel (Tofieldia glutinosa)
Ladies' Tresses (Spiranthes cernua)

White flowers, aquatics—

Pond Lily (Castalia tuberosa)
Spatterdock (Nymphaea advena)
Water Plantain Alisma (Plantago-aquatica)
Floating Heart (Nymphoides lacunosum)

Blue or purple flowers—dry or sandy soil—

Large-flowered Beardtongue (Penstemon grandiflorus)
Penstemon acuminatus
Pasque Flower (Anemone patens var. wolfgangiana).
Wild Lupine (Lupinus perennis)
Spiderwort (Tradescantia virginica)
Harebell (Campanula rotundifolia)
Tall Harebell (Campanula americana), an annual
Wild Bergamot (Monarda fistulosa)
Wild Anise (Agastache Foeniculum)
Purple Cone-flower (Brauneria angustifolia)
Aster sericeus, Aster laevis.
Aster Tradescanti
Bird's-foot Violet
Viola pedata
Viola pedatifida
Oxytropis Lamberti & O. splendens

Damp Soil

Tall Lobelia (Lobelia siphilitica), meadows.
Aster Novi-Angliae
Blue Flag (Iris versicolor)
Closed Gentian (Gentiana Andrewsii)
Fringed Gentian (Gentiana crinita), an annual difficult to cultivate, because the seeds ripen the second year.
Ironweed (Vernonia fascicularis)
Forget-me-not (Myosotis laxa), banks of streams
Pickerel Weed (Pontederia cordata), shallow water

Red or pink flowers, dry or sandy soil

Three-flowered Avens (Geum triflorum)
Oxalis violacea
Wild Onion (Allium cernuum)
Gaura coccinea
Corydalis sempervirens
Phlox pilosa & P. maculata
Fire Pink (Silene virginica)
Purple Prairie Clover (Petalostemum purpureum)
Spider Flower (Cleome serrulata), a large annual
Blazing Star (Liatris spicata, pycnostachya, scariosa, punctata, cylindracea)

Meadows—

Hibiscus militaris
Turk's-cap Lily (Lilium superbum)
Germander (Teucrium canadense)
Woundwort (Stachys aspera)
False Dragon Head (Physostegia virginiana)
Swamp Milkweed (Asclepias incarnata)
Jo-Pye Weed (Eupatorium purpureum)
Cardinal Flower (Lobelia cardinalis)

Yellow and orange flowers, dry or sandy soil—

Sun Drops (Oenothera fruticosa)
Gaillardia aristata
Ox-eye (Heliopsis scabra)
Black-eyed Susan (Rudbeckia hirta)
Compass Plant (Silphium lacinatum)
Sunflower (several species)
Golden-rod (several species)
Cone Flower (Lepachys pinnata)
Butterfly Weed (Asclepias tuberosa)
Goat's Rue (Tephrosia virginiana)
Partridge Pea (Cassia chamaechrista), an annual.

Meadows—

Canada Lily (Lilium canadense)
Great St. John's wort (Hypericum ascyron).
Sneezeweed (Helenium autumnale)
Golden-rod (several species)
Lotus (Nelumbo lutea), aquatic.

Meadow Grasses—

Phragmites communis
Glyceria grandis
Indian Rice (Zizania aquatica), aquatic

Digitized by Google

The Man Who Buys.

J. M. LINDSAY, NURSERYMAN, AUSTIN.

I am going to speak to you of one of the chief pests of the nursery business. I don't refer to the San Jose scale, the black gnat, the codling moth, nor any other of the eighty-six plagues of the horticulturist. We can spray or we can burn these pests, but we have one that is perennial, and we each of us encourage its existence. I refer to that pestiferous pest, the man who buys nursery stock who doesn't give it proper care and who then demands that it shall be replaced.

This man—and his name is legion—will devote more time and pay more attention to curing a ten-cent chicken of the pip than he will in caring for a tree that will bring him pleasure and profit for thirty years.

We all send out directions how to plant nursery stock. Our farm papers, our horticultural journals and the newspapers are full of advice. Now I think we are too technical in our directions. We tell the average man too much about the need of nitrogenous matter in the soil. We talk of phosphates, potash and other chemicals. We dwell upon the effects of radiation of heat, atmospherical effects, etc. If he followed the planting rules as laid down in some of our journals, he would require blue prints and specifications. The directions for digging the hole for the roots are sometimes as elaborate as for digging the Panama Canal.

Now, technique is all right among ourselves, and it's all right for the man who is going into the fruit business on an elaborate scale—but aren't we apt to be too technical? We are giving the average man post-graduate courses in horticulture when all that he needs is how to plant a tree. We should teach the a-b-c of our business to the average buyer. We should teach him that a tree, a shrub, a plant, is a living organism as much as a cow, a pig, a horse or a man himself. It breathes, it drinks and it feeds. Now give it a chance to do these things. If the buyer throws a bunch of nursery stock into a shed and leaves it there, it can't breathe, it can't eat, it can't drink.

Some day the buyer thinks of that nursery stock, and he plants it, and it yields up the ghost instead of yielding fruit. I can sell ten trees to one man and ten trees to another. They are neighbors, yet when the next spring shall come to one man will have saved ten trees, and the other will demand that I replace eight of his. Why should I replace that stock. It died of his negligence. If he sold me a setting of eggs, and I didn't use them until they were spoiled he wouldn't replace them, yet I am expected to replace the stock he permitted to spoil before

Digitized by Google

planting. I don't know how nor why we have allowed this pernicious practice to grow. Perhaps it is because of professional jealousies. Whatever the cause, the cure lies within ourselves.

Let us give to the buyers of our stock good common sense directions about planting and say to them, "Here is our guarantee. Follow these directions and your trees will grow. They are living things. Treat them as such. A fish won't live out of water; a tree won't live with its roots out of the ground. Trees drink; see that they don't get thirsty. They eat; see that their roots are placed in good soil. The roots are the mouths of the plants, so don't destroy them. Give these plants the same good care in proportion to what you give your garden vegetables, and they will live. They will flourish like the green bay tree, blossom like the rose of Sharon and bear better fruit than the fabled "Apples of Hesperides."

Early Tomatoes for the Farmer and Gardener.

FRED NOERENBERG, CASCADE SPRINGS, S. D.

We are living in an age of specializing, and I by necessity must need do the same. Fruit growing is all right and pays well here, but there are spaces of time that can well be filled out with gardening. In planting a garden I don't believe in too small patches, so I raised enough to sell some of the truck, but found that I lived too far from market to obtain the best of results, and so I set to specializing on tomatoes.

Long ago I learned that I must choose a type of tomatoes with small leaves and short vines, to get all possible sun on the growing and maturing fruit. By planting different kinds of earliest tomatoes and saving the seed myself of the best and earliest, I soon had a type of my own, which in all respects had the required qualities above mentioned, besides being prolific, of good size and smooth. For ten years I have planted this particular type, and by always staking the earliest, smoothest and most prolific vines for seed, I have reduced the time of ripening from the 15th of August to the 22d of July, in 1911, which is very early considering the cool nights at this elevation of 3,422 feet above sea level.

I prepare my ground very carefully by deep plowing and frequent harrowing before planting. Moderately rich sandy loam is best. I plant four by four feet and leave every ninth row out to go through with a sled and one horse to haul in the fruit.

Digitized by Google

When planting I use cans or sometimes paper tubes for protection against cutworms and wind. I go through with a cultivator within a week after planting, and the next week with the hoe in the row and follow this rule until the vines interfere with horse cultivating. The time of planting here is the last ten days in May.

My way of fertilizing is not to use much stable manure, but before planting, or sometimes after planting, I scatter chicken manure over the field, about a small shovelful to each plant, and this is cultivated into the *surface* soil and is available as plant food immediately.

By saving chicken manure and keeping it dry before using as a surface dressing it is easily worth $20 to $30 a ton, and the fruit will be smooth and large without the vines making a rank growth, and therefore the fruit ripens quickly.

I will not describe how to plant the seed and how to make a hotbed or hothouse, but would like to state here one experience I had with paper pots. Sowing the seed in flats I transplanted the plants into the hothouse March 20th in paper pots, 2½x2½ inches; other plants I planted 2x2 without pots. The rest I sowed in rows in hothouse the same date.

Fruit from paper pot plants was three days earlier than from plants planted in hothouse, and only five days ahead of ripe fruit from seed sown on March 20 in hothouse.

In paper pots roots were more or less root bound and never made as vigorous a growth as the others.

By setting about 2,400 plants I cover not more than three-fourths of an acre, and the crop has not varied much from year to year. I have gathered over seven tons of tomatoes from the above mentioned number, which sold all the way from 10c to 2c per pound, and when the season runs late were still bearing good but small tomatoes, which I made into catsup and sold for 60c per gallon. My earnings from the three-fourths of an acre are about $400 to $500.

In about fifteen years I had two failures, and both from hail, otherwise the crop is sure.

I gather apple boxes during the winter from local merchants, paying 10c each, and by packing a little harder and greener in the lower half they ship well for 100 miles and more.

WINTERING GLADIOLUS.—When the autumn frosts have become sufficiently hard to brown the leaves, I lift the bulbs and leave them on the ground for a day or two, after which I cut off the leaves near the bulb, break off the old bulbs, and place in shallow trays in the shed for a week or two. I then go over the bulbs, removing the dried bases of the leaves and any loose coverings, after which they are placed in fruit baskets, carefully labelled, and left in a dry place, free from frost, until required the following spring.

Digitized by Google

My Pear Experiment up to Date.

REV. JOHN B. KATZNER, SUPT. TRIAL STATION, COLLEGEVILLE.

Considering that many of the good people of our society are much interested in my special work of growing pear trees and would like to know how my work is progressing, what experience I have made and what prospects there are, I thought it best to write an article on above subject that would give them full information of all my experience up to date. I am aware, too, that many have tried to grow pear trees, but with indifferent success, and that many more would make an effort if they only knew just how to get at it properly. For such this article may be helpful in a way to start them right. While I can not give scientific principles nor vouch for the truth of my statements as horticultural doctrines that hold good under all conditions, I offer only my experience as made in a fourteen years' trial of growing pear trees with the material at my disposal.

I have tried out some fifty varieties of American and European pears, some of which I imported myself, but among all these there was not one that could endure the rigors of our climate. The hardiest, no doubt, were the Russian sorts. They do not winter-kill, and I have still four kinds on trial. Having no success with the above pears, I naturally directed my efforts to the raising of pear trees from seed, and in this attempt I had all kinds of experiences, which I intend to place before you now.

The pear seed should come from the hardiest varieties and should be planted in the fall. It is most imperative for success to get seed of the hardiest pears grown, even if it should be necessary to import such seed from Europe or Asia. Whoever tried it has had the experience that seed gathered from the fine California or French pears would not do. Every attempt was a failure. Fourteen years ago I got my first pear seed from our late Mr. Chas. Luedloff, who had imported it from a German nursery. The seed came from many varieties of pears, and this gave me a better chance to find something hardy than if the seed were all of one kind. As it was spring I sowed the seed at once just as I got it. This was a mistake. The seed did not grow; it was lying dormant in the ground for a whole year. Next spring about 200 pear seedlings came up and grew a foot high. While pear seed planted in spring would grow if rightly treated, it is better sown in fall. Another time I sowed the pear seed in October, and it came up nicely the following spring.

The seedbed should be covered in spring. I have been watching the seedbed very carefully in spring to ward off any danger to the

Digitized by Google

seedlings. As soon as the seed pushed up through the earth, the sparrows thought it fine sport to pull up the tiny plants with the seed. They would have spoiled all my seedlings on the bed as fast as they came up. To prevent this I covered the seedbed with a piece of cheese cloth and had the seedlings come up under that. After the seedlings had thrown off the seedcap the cheese cloth was removed, and the seedlings were safe.

Pear seedlings are tender and liable to root-killing the first winter. I was much pleased with my 200 nice pear seedlings. The following winter was a very cold one. One day it was forty degrees below zero, and there were but three inches of snow on the ground. I was very anxious to find out how my pear seedlings would get through such a cold winter as that. So early in April I examined them very closely, and to my surprise I found that only the top bud had turned black, while the wood was healthy down to the ground. No one could have been more pleased than I; but I rejoiced too soon, as they were all in reality root-killed. I pulled them up and threw them away in disgust. Another hope blasted!

Pear seedlings if only root-killed grow readily on apple roots. Three days later the thought came to my mind: If the roots are tender and the stems hardy, why not graft them on a different root? So I picked up a dozen seedlings that were not yet perfectly dry and grafted them on apple roots. They grew readily and in a week's time were green wth leaves. When I transplanted them two years later they had grown their own roots again, and the apple roots were cut off.

Pear seedlings should be sheltered from the direct cold northwest wind in winter, for this fierce and dry wind acts on the seedlings like a pump. It pumps them dry faster than the roots are able to supply moisture, and this means the trees are frozen. The above mentioned root-grafts were planted in a place well protected on the northwest side, and the trees passed there two winters uninjured. Then I transplanted them to a place in the nursery where they were directly exposed to the fierce northwest wind, coming with double energy through a gap between a building and evergreens. Now these young pear seedlings froze back to the snowline every winter. After three or four years the best six trees were heeled in over winter and the following spring set out among the plum trees in the orchard. Four of the six trees suffered again from the cold, but the other two pear trees proved to be entirely hardy and are now twelve feet high. Those left in the nursery froze as usual and were thrown away. This trial gave me two hardy trees out of six.

Digitized by Google

Pear seedlings are to be taken up in fall of the first season's growth, root-pruned and heeled in over winter. Realizing what could be done with persistent effort and proper method, I ordered a pound of pear seed from the same German nursery five years ago. The seed came in due time and was sown in a well prepared bed in October. Next spring the bed was covered with cheese cloth, and under it my pear seedlings came up nicely to the number of fifteen hundred. Not to lose them again by root-killing, they were taken up in fall of the first season, and before being heeled in the taproots were cut back to six inches, to induce them to grow side roots. If this pruning is neglected, it is almost impossible to safely transplant pear trees with that long taproot on when grown a few years in the nursery. But if the taproot is cut back the first season, they transplant as easily as apple trees.

Pear seedlings should be laid down in fall and covered with ground. One year old trees are too small to be planted in the orchard; they should rather be grown two or three years in the nursery. The small trees, coming from their winter quarters, were now lined out in nursery rows and well cultivated. In late fall they were bent down and entirely covered with earth, even the branches and leaves. Next spring they were straightened up and cultivated. By fall many of them were large enough to be set in the orchard. They were taken out and heeled in over winter. The smaller ones were again bent down and covered. By using this method the pear trees never suffer from the cold till they are ready for the orchard; but when they are out all winter, most of them, if not all, are injured, and their after-growth is very poor.

Pear trees are more subject to blight than apple trees. We have to guard against blight as much as possible. The soil should not be too rich in the nursery. A sandy clay of moderate fertility suits them pretty well. Cultivation should not be too intensive nor too long continued, so the trees make no rank growth. Be satisfied with a moderately thrifty growth, and blight may thus be prevented. None of my pear seedlings ever blighted. But the ground is rather poor and sandy, and the trees did not grow fast enough for blight to touch them. A pear orchard should be well protected from the northwest wind and have good subsoil drainage.

Now comes the bugbear of pear growing. If you miss it, all your work may be lost. According to my experience I would choose a high location that is well protected on the northwest side by a forest or a grove of tall trees. If the young and otherwise reasonably hardy pear trees occupy such a location, they will not suffer much from the still or quiet cold of winter. The behavior of the above dozen pear trees

Digitized by Google

has about proven this point to my satisfaction. Yet to be certain I have planted my 500 pear seedlings in six different locations and may have more to say about that in the future. The subsoil should not consist of a stiff clay or a hardpan; a loose, sandy clay is about the best, so the roots of the pear trees can easily grow downward, as it is their nature to do. It does not matter much if the top soil is not very good as long as the subsoil is fertile; pear trees take their food from the ground farther down. Water should not accumulate in the subsoil, but the trees ought to get sufficient moisture. However, not enough water is by far better for them than too much of it. The same method may be used for planting pear trees, as is in vogue for apple trees. The pear trees are to be cultivated somewhat to keep them in a moderately thrifty growth, and all stimulants for fast growth are to be avoided. This seems necessary to prevent blight and keep the trees healthy. Cultivation should be stopped by July to give the trees a chance to ripen the wood well. A moderate development will give you the best, healthy trees.

The pear trees should be protected from sunscald. Besides being liable to be frozen during winter, there is another most serious danger to pear trees that must be provided against if we do not want to lose our trees, and that danger consists in the alternate thawing and freezing in March. The most tender spot on a pear tree is on the stem a foot up from the ground. The first indication that your trees suffer from the above cause are a few black spots on the south side of the stem a foot up from the ground. These spots increase in number up and down the stem, grow larger, unite and form a black streak. This spreads out around the stem, the bark and wood turn black, and the tree is dead. As a sequel, the branches are the last to succumb. I observed this fact particularly in the spring of 1911 on forty of my pear seedlings which were killed just that way. It was not the cold of winter that caused it, for early in March, with the exception of a few terminal buds which were frozen, the forty trees were perfectly healthy in bark and wood, and by the end of that month they were killed. Now what shall we do to prevent this? My dear friends, what are you doing to prevent sunscald on apple trees? Why, shade them, of course. Very well; do the same thing to your pear trees, and they will get out of this danger safetly, for this is nothing else than sunscald on pear trees. This point, too, is very well substantiated. In spring of 1910 I set out 180 pear seedlings. They all grew. In fall they were protected with laths tied to the trees on the south and north side as a protection against mice, rabbits, and sunscald. In the spring of 1911 I found only six trees frozen down to the ground. Quite a

Digitized by Google

few had suffered from the winter's cold and made but a feeble growth, while very many passed the winter in a very good condition. But no tree was killed by sunscald. All the pear seedlings now set out are a little more than 500. They were all protected last fall, and I expect them to pass the winter safely. More than a hundred seedlings are still in the nursery; these were bent down and covered with ground. As I had more pear trees than I could well take care of, I presented about 700 to the State Fruit-Breeding Farm.

If the pear trees get through safely the first winter after transplanting, all that is now necessary is a little cultivation and a good shade on the stem to avoid sunscald. If the stem is not scalded, the branches will not suffer, and the top will take care of itself. When in after years the branches reach out and shade the stem, and the thicker bark, too, offers more resistance, this protection may no more be necessary.

What may I reasonably expect from my pear experiment? Although the seed did not come from the hardiest varieties, and many trees will be found too tender for Minnesota, yet there are quite a number among them that are or will become sufficiently hardy. I expect about one hundred of them to survive, but it is yet too early to state positive results. I do not know what may turn up next to spoil my expectation. I cannot expect very good pears, as these kinds of pears are only grown in Germany for hardy seed and stock growing and the fruit for drying and perry-making. However it may turn out, I would be quite satisfied if I should succeed in growing only crab pears; they could be used the same way as our crab apples, which we all know are good eating. But the greatest advantage might result from top-grafting. Having hardy trees once, as I think there are among my seedlings, we can grow hardy seed, raise hardy trees and top-work them with less hardy but good varieties. For this point, too, I have quite a pertinent fact.

Tender varieties of pears may be grown on hardy pear trees. Three years ago I top-grafted one of my two large and hardy pear trees with ten named European and American varieties. They grew nicely on the seedling and passed two winters in pretty good condition. Neither bark nor wood was discolored, only the pith turned slightly black for half a foot down, while the very same varieties, from which the scions were cut in the nursery, froze down to the ground as usual. This fact, no doubt, shows the possibility of growing good pears on hardy stock. Unfortunately I had to cut that grafted pear tree off. Canker got in two feet above ground and killed the bark for one foot up. This two-foot stump grew a nice top last year and is now again

Digitized by Google

five feet high. I split the cut-off stem its entire length of eight feet and found the tree to have been perfectly healthy from pith to bark. There was no flaw, no black lines or rings, no discolored wood, that would indicate the tree to have suffered from the cold of the last six winters. This certainly shows the tree to be hardy, which tree, as stated above, was first root-killed, then top-killed, every winter for several years. Indeed, this seems to show that pear trees arrive only at their greatest degree of hardiness when they are past their infancy.

Now, my dear friends, I have told you all about my experience in growing pear trees, I have given you the plain facts just as I have found them. Should my judgment have misled me, I would sincerely regret it. Had I had hardier material to work with, no doubt the reading of this article would be different and more encouraging. Yet, as it is, I am quite satisfied with the knowledge gained from these experiments. What ultimate results may come from them I am not ready to say. But whatever may happen to the trees, I intend to keep you informed of it. Should you try yourself to grow pear trees, I wish you much success, and if you should find this article particularly helpful in your efforts, I would consider myself well paid for the trouble of writing it.

Top-Grafting, Past, Present and Future.

EDSON GAYLORD, NORA SPRINGS, IOWA.

Far back near the beginning of modern history we read of their grafting the tame olive into the wild olive for the purpose of making a worthless tree bring forth better fruit. In 1885, wanton destruction swept over our great Northwest, wiping out nearly everything in the apple belt; not only all our half hardy but very many of our hardy kinds were killed, root and branch. I set no trees in 1885 but went at once searching amongst our dead and dying trees to learn if possible some way by which we could replace our fruit trees and have them stay with us. I found in one orchard one tree that had been grafted in its top with the choice Baltimore, a No. 1 winter apple. It had been set on the Minnesota crab some three years before and has been bearing ever since. Later on I sent to the United States exhibit hall at St. Louis, some years ago, two barrels of these apples grown on my Hibernal trees in this same orchard where this Baltimore was then and is today. I found five Fall Orange trees, four on their own stems and one grafted on some crab. This one on the crab stock came through unhurt. In 1880 I grafted a Ben

Digitized by Google

Davis on a Duchess that was then bearing and was then unhurt. Its fruit excelled all others, no finer ever came from Missouri. I grafted that same year a Hyslop crab with Fall Orange that was in bearing before '85. Its owner has often told me that this was the finest tree in his orchard. Recently this tree was blown down in a heavy storm very heavily loaded with fine apples. I made it a point to go and examine this tree, and I found this Hyslop stock had been grown on some tenderer root, which had been killed the winter of '85. Its original roots were all rotten, and the tree fed by its having a few roots grown out from the crab stock.

I could go on adding ad infinitum but deem it unnecessary, as since '85 there has been gathered any amount of reliable evidence to show any one with half an eye the undisputed value the world is to receive from this process in the near future—not only here in the Northwest but all over. The first great fact we have gained here for the Northwest is this: we can now safely grow nearly every choice variety of our own apples and plums that can be grown in our more southern climate. There is but one objection now raised against top-grafting, and this is of so little importance that it sinks into insignificance. In some very few cases we have found that the fruit is not but little improved, but in a great majority of cases the fruit is superior, and the tree much more prolific. In my experience the poorer results appear where I have grafted onto hybrids. One I will name as a poor stock of this kind is the Whitney. If I had hybrid stock I would graft onto it but would not buy such varieties. I would prefer Hibernal and Duchess. I have little choice in any of our crabs for stocks.

A large number of experiments have been conducted at the Ontario Agricultural College in preparing seed potatoes for planting. It has been found that, on the average, potato sets taken from good sized potatoes will give a little larger yield per acre than potato sets of the same size taken from smaller potatoes. The size of the sets which are planted have a very marked influence on the yield of potatoes per acre. The number of eyes per set exerts a slight influence, but not nearly as much as does the size of the pieces.

Under average conditions it is wise to cut good sized, smooth potatoes into pieces which will weigh from one to two ounces each, and which will have two, three, or four eyes in each set. If there is only one eye in a set the yield is lighter, and if there are five eyes in each set there are too many small potatoes. In some sections large seed potatoes will likely be very scarce and very expensive this spring. A potato set one ounce in weight, cut from a two ounce potato, will likely give a greater yield than a half ounce set taken from an eight ounce potato.—Canadian Horticulturist.

Digitized by Google

Drainage in the Orchard.

PROF. JOHN T. STEWART, CHIEF, DIVISION OF AGRICULTURAL ENGINEERING, UNIVERSITY FARM, ST. PAUL, MINNESOTA.

Plants, like animals, are adapted to live and develop in certain conditions of land and water. Some are so constituted that they live entirely in the water, others in land, and still others in both land and water; but regardless of the environment surrounding the development of each, a certain amount of air and water is always necessary. None of the higher forms of life can exist without either.

The plants and animals which are best suited to agricultural purposes, and from which the greatest revenues are derived, are those requiring only a small amount of water for their development; an excess of the required amount impairs their growth and may eventually cause death. Consequently, in developing lands for the production of nearly all plants, it is necessary to give some thought and attention to the water conditions—to supply water when it is needed, and to remove it when in excess. This is true in the development of orchards almost regardless of the fruit that is to be produced, for nearly all our fruit trees have been developed from plants which grow best in a moist soil. Therefore, for their best development and production, surplus water should be removed and necessary water supplied when these conditions are not provided by nature.

The soil, as we all know, is composed of minute grains of varying diameters. Each of these grains has the faculty of surrounding itself with a thin film of water, which it retains with considerable tenacity. As these grains are not packed tightly together, there is more or less open space between them. This open space is occupied by either air or water. In an undrained soil the spaces are filled with free water, which drowns out all dry land plant growth and prevents root penetration. In a drained soil this free water does not exist; the space between the soil grains is filled with air, which provides the proper habitation for dry land plant roots. The film water which surrounds the soil grain cannot be carried off by drainage, but the free water will flow readily when an outlet is furnished.

Plants feed from the earth through the root system, the main collectors of food being the mass of rootlets and root hairs which cover the larger roots. The plant food is dissolved by the film water and is taken up through the roots. Consequently, if the plant is to develop properly, it must have an unlimited range for its root system, and the soil in which it feeds must contain the proper amount of water and no more.

Digitized by Google

An examination of trees and plants growing in swamp regions and of those growing in high, dry land shows a great difference in root development. The swamp plant grows along the surface, the roots extending out laterally and not down. In dry-land roots and plants the roots will be found to go down to a great depth, and they do not extend a great distance to either side of the plant along the surface of the ground. This fact can be easily seen by examining roots of trees which have blown over. It will be found that tamarack, a wet-land tree, blows down very easily and exposes a large area of roots, but they have no depth, while pine or oak, dry-land trees, are difficult to blow down and tear up a large volume of earth, leaving a deep pit.

John T. Stewart, Chief of Division of Agri. Engineering, Dept. of Agri., University of Minn.

It is evident that the plant must have sufficient food to supply its needs for growth and the maturing of the crop which it produces, and it must have sufficient anchorage to prevent overturning in a wind storm. It can be readily seen that if the tree is forced to feed on the surface foot of soil, it will die of starvation much more readily than if it has five feet of soil in which the roots can ramify and get the necessary food. The starving plant, like the starving animal, is susceptible to diseases against which the well fed one is immune. Therefore a deep soil in such a condition that the roots can extend to their maximum is extremely desirable.

While we are removing surplus water to increase root growth, we must not neglect to take into consideration the furnishing of necessary moisture for the growth of the tree. At first thought it may seem a contradiction when the statement is made that the same agencies which remove soil water and dry out the soil sufficiently for the plant to grow also make available a supply of moisture for the use of the plant. A soil which is saturated with water dries very rapidly when exposed to a hot sun or wind. This sudden drying causes the soil

Digitized by Google

grains to be drawn together in small masses, leaving large open spaces between. This can be readily seen in the bed of a slough which is drying up in August. These large openings, usually known as cracks, often become a couple of inches in width and eight inches to two feet in depth. When such cracks are open in the soil, it permits a too rapid circulation of air, causing the film water to dry out, and thus reducing the plant moisture in the soil at a time when it is needed—for if the ground has been saturated, the roots are growing along the surface, and these cracks will extend below the root growth. This contracting of the soil also breaks and tears apart the root hairs and the small rootlets, so the plant does not have the proper number of feeders to supply it with moisture.

In a drained soil there will be no contraction or cracking during a dry period. The roots go deep into the soil, and they are not broken or torn and are in proper condition to work to full capacity. They descend nearer to the moisture lying deep down, and by the aid of capillary attraction are enabled to secure moisture not available for a shallow rooted tree. Consequently, a plant on drained soil stands dry years better than one on undrained land, for the reason that it has developed its root system to the greatest extent, and this system is undisturbed and has a greater field from which to draw both moisture and food.

The above facts have been demonstrated in so many soils and under so many conditions that it is not a theory but an actual fact, and in late years many soils have been drained that were originally considered dry, for the reason that better production was had with more thorough drainage than nature had provided.

Therefore, thorough drainage:

Causes the tree to be imbedded in the earth so it will not be overturned by a windstorm;

Increases the supply of food, thus stimulating a vigorous growth and making it resistant to disease;

Increases its production in wet seasons for the reason that it prevents stunting of growth by roots trying to live in a saturated soil;

Increases the production in dry seasons by conserving the film moisture in the soil and making available moisture lying deep below the surface.

The problem now becomes: How shall this work be accomplished? Open ditches relieve the soil of surface water, but in most soils do not lower the ground water sufficiently to thoroughly drain it.

The cheapest and most thorough system of drainage is by use of drain tile. This method of drainage has been in use many years, is thoroughly tried out and is not an experiment.

Digitized by Google

The method of tile draining for orchards is practically the same as for any agricultural lands, adapting it to the condition of trees instead of field crops. In ordinary field crops tile are placed from thirty-three to 300 feet apart, and from three to four feet in depth, but as the tree presents a much larger root growth than ordinary field crops, the distance apart of the drains should be decreased and the depth increased. Good practice indicates that tile in orchards should be from four to five feet in depth, and a string of tile between each row of trees is desirable. I understand the present custom of planting orchards is to arrange trees approximately twenty feet apart in one direction and twenty-five in the other, thus making the tile lines twenty-five feet apart. This will undoubtedly look expensive, but it must be remembered that an orchard is a crop preparation for which is much more expensive than for the ordinary field crop. One planting is supposed to last many years, and the value of the production per acre is many times that of field crops. Consequently the drainage could afford to be much more expensive per acre.

In the planting of an orchard, when funds are low, it might not be advisable to lay tile between every two rows. If there is fairly good natural drainage, the tile could be put in every fourth row making them one hundred feet apart. As the trees increased in size, strings could be placed midway between, making them fifty feet apart, and at a later period, if the rows of trees near the tile had better growth and produced better than the others, it would be an indication that more drainage was needed and the remaining strings could be laid, making them every twenty-five feet. This could be done as they are needed, and there would not be so great an outlay in the beginning.

Whatever system of drainage is adopted in the orchard, I wish to impress you with the fact that they should be laid at sufficient depth, as the roots of trees go much deeper than those of field crops. Depth of tile satisfactory for such crops will not be satisfactory in the orchard. They should be held down pretty close to five feet and the system should be so constructed that intermediate lines can be laid whenever they are needed. In this way there will be no work lost, and proper drainage can be installed at minimum cost. The size of tile, methods of laying, outlet, etc., will be practically the same as for any tile system. Ordinarily four-inch tile will be sufficient for lines between rows.

It was suggested that I also treat briefly on the irrigation of orchards.

There are some soils and undoubtedly some seasons in Minnesota where proper methods of irrigation would prove a valuable adjunct

Digitized by Google

to the fruit grower. I shall not have time to take up this matter in detail, but will make a few general suggestions.

Many people have the idea that one system will answer for both drainage and irrigation. On account of the great depth to which it is necessary to drain orchards it is only in very special cases where such a system would be satisfactory for sub-irrigation, for the reason it is too far below the surface, the tendency of water from tile being to go down rather than up.

The better methods for irrigating trees have been fully described in a Farmers' Bulletin 404, on "Irrigation of Orchards," which can be secured of the U. S. Department of Agriculture.

The furrow method is one of the most common. Small furrows are made from three to four feet apart between the trees, and as close to the trees as a team can work. A few cross furrows connect the two nearest the trees. The water is then turned into these furrows from the head ditch and is kept running for several hours. In this way the ground becomes thoroughly saturated.

Another method is known as the check method. A ridge is thrown up around a certain number of trees. This ridge prevents the water from spreading, and a pond is held until it has time to soak into the earth.

These are the two methods in most common practice. Where water is scarce or expensive, it is best to conduct it to the furrow or check in iron pipe or through hose. Persons who have irrigated orchards in the humid states have expressed the opinion that an irrigation system pays even though the plant is not needed every season.

The principal difficulty with amateurs in irrigation is they do not apply enough water. Until one has become accustomed to watering crops, he does not appreciate the amount of water necessary, and in some cases actual damage has been done to crops by the application of a very small amount of water.

Perhaps there is no other problem that affects the plant or tree in its growth, health and producing qualities so much as the control of water—either too much or not enough being equally injurious, and the successful fruit grower is the one who has this problem as near under his control as it is possible for him to bring it.

Digitized by Google

Growing Flowers.

A QUESTION AND ANSWER EXERCISE CONDUCTED BY MRS. H. B. TILLOTSON, MINNEAPOLIS, AT THE LATE ANNUAL MEETING OF THE SOCIETY.

Mrs. H. B. Tillotson: I presume I am here this morning more for the purpose of answering questions rather than to give you any set address upon the subject of growing flowers. Roses are my specialty, and I have them all over my grounds. In the fall I cover them with dry leaves and put a little dirt over to hold down the straw and leaves. Straw alone will blow off, and it is necessary to hold it down with something like dirt or boards. It is generally supposed that iris and peonies do not need any covering, but they are very much better off if they have it. I have one question that has been asked in connection with iris, and that is, why will the iris grow very well and vigorously and still refuse to bloom. I have some in my garden that have done that, but I thought perhaps it was because they had not been in the ground long enough and did not have strength enough to form buds. It may be that they were seedlings and did not form buds, and it may be by taking them up and putting them in different soil it might make a difference. Sometimes you will find it is not the right kind of soil. You all know that different soils have different properties, and it may be that this iris is not satisfied with its home, and that a different soil might provide it a more congenial home in which it would do better. I would take it up and separate it the same as the peonies, and then if it does not bloom there must, of course, be something else the trouble with it.

I have another question about the dahlia. I take care of my dahlias just the same as I do potatoes. I have a small cellar, and I make a pit in one end where it is not cemented, and I cover it with straw. They have the same protection that the potatoes have that I keep during the winter.

Mr. Emmans: Why do you put the roots in the cellar? It was understood that you put them in boxes.

Mrs. Tillotson: I put them in boxes if the cellar is not too cool or too hot. Our cellar floor is not cemented, and we have a pit just like a box, and in it we put the dahlias and cover them with a thin layer of straw and then a foot of dirt. Of course, it is not wise not to have ventilation, and for that purpose I run a small water pipe up through the box. If you cut off the air entirely the roots would rot. If we had no ventilation at all they would heat and sweat, and that is why we have this little pipe put in the pit. The pipe sticks out from the middle of the pit.

Mr. Emmans: Would you advise digging them up in the autumn and leaving an inch or two of stem on them and hanging them up to the ceiling?

Mrs. Tillotson: No, they would dry out. I cover them up in the pit and keep the air and moisture away from them to that extent. If it is an uncovered box, the air will get in through the soil more or less.

Mr. Husser: I have some five bushels of roots. I take a common apple barrel and saw it in two, and I just take the roots and place them

Digitized by Google

in the barrel, and I take them out in the spring. The temperatures run from forty-five to sixty. I take them out in the spring, knock the dirt off the roots, and they are always in a very good condition.

Mrs. Stager: I have had success in keeping dahlia roots, but I did not take quite as much trouble with them as some of these people who have explained their method. I cut them off from four or five inches from the root, then cover them with dry sand in the cellar. I have a bin eight or ten feet long and six feet wide, and I put them in there and cover them with sand, thoroughly dry sand, and they are in perfect condition when I take them out in the spring. I grow a good many of them because I furnish flowers for the market.

Mrs. H. B. Tillotson.

Mrs. Tillotson: I think anything along that line is all right. Sand is warmer than the soil, and it makes them start earlier in the spring.

Mr. Underwood: Does it hurt the dahlia roots to dry out?

Mrs. Tillotson: Yes, I think it does. They need moisture to start in the spring. When you divide them in the spring, with a pruning knife, you should split them up through the bottom and see that every root has at least one good strong bud. Sometimes two or three are better than one. When they come up you should watch the stalks and let only the stronger one grow, breaking off the weaker ones.

Mr. Emmans: Do you recommend starting them in the spring before you set them?

Mrs. Tillotson: You can get at it too early, and the frost will get them. The 20th of May seems to me early enough to have them showing through the ground.

Miss White: Don't you think the blossoms are better, a richer color, when they come later, have nicer blossoms?

Mrs. Tillotson: I never thought of that, but I think that might be so.

Mr. Husser: It does not make any difference when you plant them in the summer, when the cold nights come in the fall the blossoms are a great deal more brilliant. The benefit in planting them earlier is that you get earlier flowers. We start them in a hotbed and set them outdoors when we think the time of frost has gone by. We set them out when they have a good bud, and we cover them with bur-

Digitized by Google

lap. When there is danger of frost we cover them over so as to protect them, and we have flowers the Fourth of July.

Mr. Johnson: Do I understand that they had sprouts when you set them out?

Mr. Husser: Sometimes they have four or five of these sprouts when we plant them in the open.

Mrs. Tillotson: If you want to start them early you can put in the bottom of a bushel basket a layer of excelsior, then a layer of dahlias or gladioli, another layer of excelsior and then another layer of bulbs until you get as many as you want in the basket. Then cover and sprinkle with water and set behind the kitchen stove, and in three or four days the moisture will start the bulbs. Tuberoses may be started in the same way.

Mr. Johnson: Do you put them in a basket in clumps, or do you divide them?

Mr. Tillotson: I divide them first; if they have growing sprouts they break off too easily.

Mrs. Anderson: You did not tell how to divide them before you sprout them. I divided mine this year when the sprouts were eight inches long, and then I had to pinch them back. I think the best way to divide them is when the sprouts are four or five inches long, but if you let them grow longer they will get away from you. It depends a great deal upon the amount of care you give them. Of course, I suppose with very good care they could be handled in that way, but when the sprouts come up above the surface they must be handled very carefully.

Mr. Clark: How do you save cannas?

Mr. Husser: I have had great success with cannas. I have carried bushels of them over and never lost a single lot. Dirt is a natural preservative of any bulb, and the object is to take up the bulbs or the clumps of root and knock off as little dirt as possible and then allow them to cure. Let them dry and then put them into the basement, to remain until spring, and in spring I take them out, and they are just as fresh as when I put them in, and they do not lose one bit of vitality.

Mrs. Gotlocks: Where do you put them?

Mr. Husser: I place them in an ordinary apple barrel, placing the root up with the top down. I leave the dirt on, and in the spring I knock it off and the bulb comes out perfectly satisfactory and in perfect form. I have put up as many as eighteen barrels of bulbs.

Mr. Henderson: How do you preserve the calladium esculentum?

Mr. Husser: That is entirely different from the canna, from the fact that they must not have the leaves taken off. I had trouble with them last winter. I simply placed them in sand, and I lost a number of them. This year I laid mine on benches and propose to keep them there until time to start them, and when I see they begin to start I place them in soil and allow them to start. You can divide them in the spring. In that way they keep in good shape.

Mr. Baldwin: Do you leave the clumps together?

Mr. Husser: Yes, I leave them all together. This is a different bulb from anything else we have. The leaves come singly out of the

Digitized by Google

bulb and start, and if you destroy the leaf you destroy the bulb. You have got to let them dry in order to be successful with them.

Mr. Hunter: Last year we had a failure, but this year we worked it differently. We dug up the bulbs, and just before I left home they put them behind the stove in a basket, and to my surprise there were sprouts growing out of the bulbs.

Mrs. Tillotson: Here is a question asking what kind of flowers will grow on poor soil. I hardly know what to say about that. We have a lot of them, but I suppose we want the best. One of the best annuals I know of is the nasturtium that will do best on poor soil and will give an abundance of bloom. The nasturtium will give more blossoms on poor soil than it will on rich soil. There is the alyssum and the phlox oblata that will also grow very well on poor soil. There

"In the spring time" at Lake Minnetonka residence of Mrs. H. B. Tillotson, facing her beautiful garden of flowers.

is another flower that I read of in "The English Flower Garden," by William Robinson, but I cannot think of the name now. If any of you want to know about the flower garden, you should read that book. While the conditions do not apply to this country, it speaks of almost every flower that grows, and it describes conditions under which flowers best grow, and in fact it tells everything about flowers. Then there is another book on garden flowers by Sedgwick, which is also a very good one.

Mr. Anderson: The petunia will also grow in dry places.

Mrs. Wyman: Another flower that will do very well on a poor sandy soil is the dimorphotheca aurantiaca (African golden daisy). I had that at the edge of a gravel bank and it did finely. It makes a perfect mat of flowers and is very suitable for cutting, the stems being some twelve inches long. It is one of the latest blooming flowers we have. I had them after the first of November this year, and I had nothing in my garden that stood the frost so well, although the asters did very well.

Mrs. Gould: The cosmos grows well in poor soil also.

Digitized by Google

Mr. Kellogg (Wis.): The sand flower is another good one.

Mr. Husser: The cosmos wants a very sunny location, and in an ordinary soil it will do very well. The stalks should be far apart, and when about two feet high the stalks should be pinched down in order to make the plant bushy.

Mrs. Tillotson: The yucca filamentosa does very well on poor soil.

Mrs. Wyman: Another one is the pink. The sand pink and the rock pink are very beautiful and grow very satisfactorily on poor soil. The foxglove grows a great deal better on poor soil than it does on rich soil.

Mrs. Tillotson: Here is another question for us to answer. The questioner wants to know what are the best ornamental trees, shrubs and flowers that will grow satisfactorily on moist ground. One tree I know that does well on moist soil is the birch. However, it is more apt to winter-kill on moist soil. The willow is another good tree to grow in moist soil, but the willows grow so over everything that I just hate them.

Judge Moyer: The different species of cornus do well on moist ground.

Mr. S. D. Richardson: The cut-leaf birch does well on moist ground also.

Mrs. Perkins: Our native dogwood does well in moist soil.

Judge Moyer: The salix uralessis thrives well on moist ground.

Mrs. Tillotson: Now we have mentioned a number of trees, does anybody know of a shrub that will grow on moist ground?

Judge Moyer: There is the high bush cranberry, the viburnum opulus Americana, that does well in moist situations.

Mr. E. B. Miller: The native wahoo is another good one.

Mr. Carpenter: The black haw is another good one if it grows in Minnesota.

Mrs. Tillotson: It grows in Ohio where I came from, and I know it grows at Lake Harriet.

Mr. Simpson: I think you will find that all over Minnesota.

Mrs. Tillotson: Now has any one any flowers to mention that grow on moist ground?

Mr. Underwood: There are a great many wild flowers that do well in moist situations.

Mrs. Wyman: The trillium grows well in moist ground. The wild euphorium is a very fine flower and does well in moist ground.

Mr. Husser: How do you get rid of maggots on aster roots?

Mrs. Tillotson: I take up the aster and dip the root in hot water. That kills the bugs, and then I pour hot water into the hole and put the plant back where I took it from, and it starts up again, although it may be kind of weakly at first, but after it starts up it picks up very rapidly. If I could plant them in a different place I might get rid of the difficulty, but when there is not much room this is the only thing I know of to get rid of those maggots.

Mr. Jackson: How warm do you have the water?

Mrs. Tillotson: Why you must have it hot enough to kill the bugs.

Digitized by Google

Horticulture at the Minnesota State Fair in 1912.

A. W. LATHAM, SECRETARY.

Considering the unfavorable circumstances under which the fruit exhibit in the horticultural department at the State Fair was made the results must be considered satisfactory, and the superintendent is especially to be commended for his industry in getting together this "off year" so creditable a display. The fruit crop of the state this year has been an unusually light one. A few localities, notably the one about Lake Minnetonka, have given a moderate crop of apples, but in the state generally the yield has been very light. Under these circumstances exhibitors had little encouragement to make displays, and the result was an unusually small number of exhibitors. The season being backward, fruit also was unusually immature, and these conditions also militated seriously against the character of the fruit exhibit.

There were shown in all in the hall 3,882 plates of fruit, according to figures prepared by one of the assistants in that department. There were fifty-seven full boxes of apples, forty-seven half boxes and 160 quarter boxes, also ten half boxes of grapes. A brief analysis of the exhibit will be worth studying.

In collections of fifteen varieties of apples there were four entries, aggregating sixty plates. In collections of ten varieties there were also four entries, aggregating forty plates. In the professional class of apples there were three exhibitors of collections, aggregating 110 plates. One hundred forty single plates of apples were shown in this class. In the amateur class there were three collections, aggregating ninety plates. One hundred eighty-one single plates of apples were shown in this class. The exhibit of crabs was small, there being four exhibitors of collections, aggregating forty plates, and 173 single plates. The seedling exhibit lacked much of coming up to the average shown in that class for a number of years past. The exhibitors of collections, T. E. Perkins, A. B. Lyman and J. A. Howard, showed altogether 129 plates. In single entries of seedlings there were shown altogether fifty-five plates.

The plum crop in Minnesota this year was a phenomenal one, and as a result of this some very nice plums were shown, especially in single plate exhibits, of which there were on exhibition altogether 125 plates. There were three collections of plums "not to exceed fifteen varieties," aggregating forty-five plates, and two collections of ten, aggregating twenty plates. In all 180 plates of plums were on exhibition.

The grape exhibit was unexpectedly fine. Though not as mature as some seasons the bunches were in most cases large, and the plates averaged better than usual. There were fewer plates of small strag-

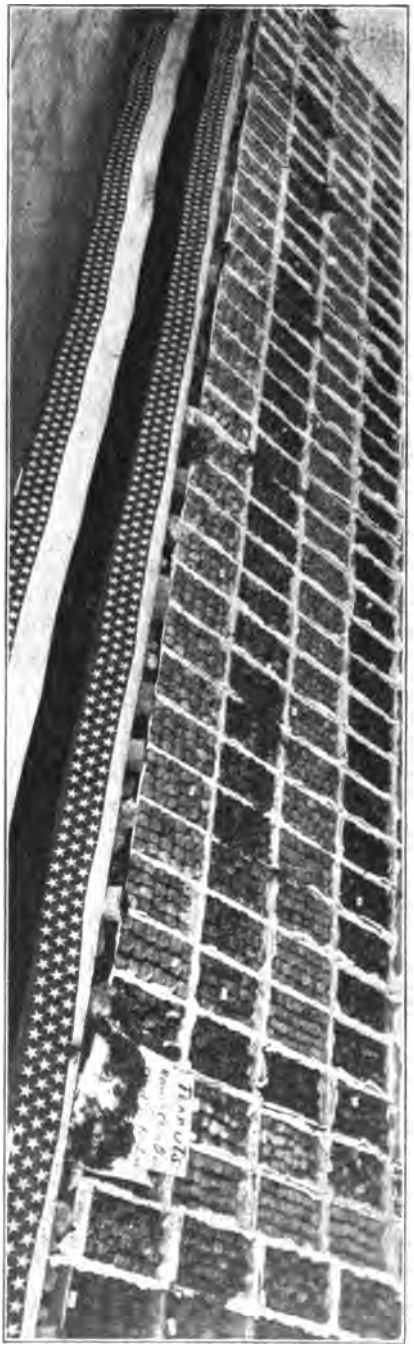
Digitized by Google

gling bunches, which is an improvement in the exhibit much to be commended. Four collections were shown of ten plates each, aggregating forty plates, and 105 single plates.

Of apples not entered for competition used to fill vacancies upon the tables there were 1,700 plates, a larger number than has probably been heretofore shown for a similar purpose, but it was made necessary by the adverse fruit conditions of the year.

Very liberal premiums had been offered by the management for box exhibits. Unfortunately there were not competitors in number in proportion to the liberality of the premiums offered. In the single box exhibit there were five competitors. Some very excellent fruit was shown in this department. In the class of three boxes there were two; in that of five boxes, three; in the class of ten boxes there were three. In the class of ten two-layer boxes there were four competitors. Altogether in these various classes of boxes of packed apples there were seventeen exhibits shown by eight separate competitors.

The box exhibit was helped out very materially by a commercial exhibit made by the Benham Investment Company, consisting of 160 quarter boxes of apples, five half boxes and ten half boxes of grapes. This exhibit made a fine showing along the



A boxed apple exhibit at 1912 Minnesota State Fair.

Digitized by Google

west wall of the building. The list of awards which we expect to publish will give further figures in the matter in detail.

The State Fruit-Breeding Farm made a splendid showing in this department, and considering this is the fourth year since its inception the results may be considered phenomenal and reflect great credit upon the management, especially the superintendent, Mr. Chas. Haralson. All the fruit shown in this exhibit were seedlings. There were 110 plates of apples, 400 baskets of plums—something over 200 of these we understand being hand made crosses between the Americana and Japanese plums. There were 350 plates of grapes, mainly, perhaps all, seedlings of the Beta, three plates of peaches, six of pears, one box of everbearing strawberries.

The State Experiment Station was ably represented in this department during the fair with an apple packing demonstration led by Profs. K. A. Kirkpatrick and A. R. Kohler; also a spraying demonstration under the management of the department of entomology.

Dr. Mary S. Whetstone had charge of the exhibit of mushrooms, which was spoken of as attracting the usual amount of attention.

Prof. Cady had a very interesting collection of shrubs arranged transplanted into a bed of earth with growing sod about them. We failed to note the number of varieties of shrubs here, but they were most of them in good growing condition, were properly labeled and were an interesting and instructive display to study.

In the floral department there was the usual show of cut flowers and flowering plants, the latter arranged in two very large beds in the center of the hall and cut flowers mainly displayed around the outer edge of the hall. The writer did not secure any figures in connection with this display. Miss Eloise Butler, connected with the Minneapolis parks, had gotten together a most interesting display of native perennial flowers in blossom, and to those who were interested in this subject it was a rare opportunity to note the great variety of such flowers growing in the state that we should become acquainted with, and which might be in many cases transplanted into home grounds. Unfortunately this exhibit was located alongside of the bandstand, and while the band played good music it was a complete extinguisher to conversation that one might wish to carry on in connection with a study of this flower exhibit. Perhaps an orchestra not producing such a volume of sound would be more appropriate for the interior of such a building.

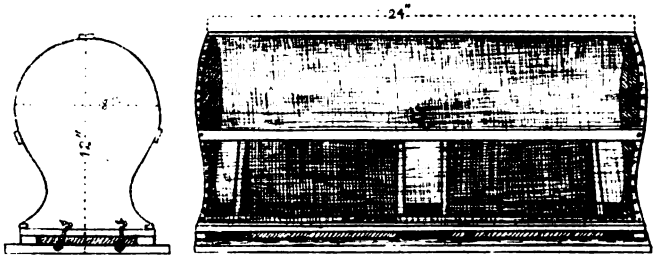
Digitized by Google

The Minnesota Fly Trap.

PROF. F. L. WASHBURN, STATE ENTOMOLOGIST.

A successful and economical device for catching flies in enormous numbers has recently been constructed and put to a practical test by the Minnesota State Experiment Station.

The Director desired to place in suitable localities on the campus some fly traps which would capture flies in wholesale quantities. Mr. A. M. Bull, of the Engineering Division, was asked to construct such a trap on the principle of the Hodge fly trap, which in turn is an improved modification of the old-fashioned traditional fly catcher of the cheap boarding house and the country grocery. The result was a trap twenty-four inches long, twelve inches high and eight inches wide, as shown in our figures. Three of these traps were delivered to this Division, two rectangular, and one of the shape shown in our illustrations, which by the way indicate very well the plan of construction.

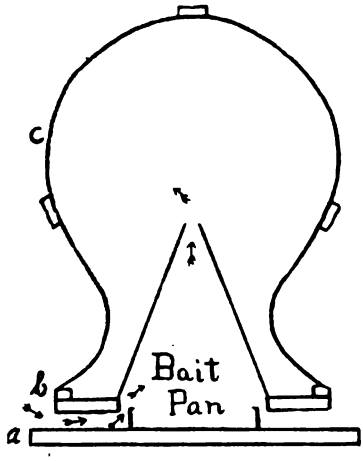


These traps have been given a thorough test with most satisfactory results, no difference being noted due to the difference in shape. The screen used is the ordinary wire mosquito screen, and that and the small amount of lumber required made each trap cost forty-one cents for material. A skillful carpenter can make such a trap in about three hours or less. The upper oval part (c) serves as a receptacle which the flies enter through the opening in the top of the middle portion (b) made of screen and shaped like the roof of a house. Under this is the base board (a), upon which rest two tin bait pans. All three parts are held together by the hooks at each end, as shown. Space between baseboard and middle portion (between a and b) about one-half inch, and between this and bait pans through which space the flies enter pans, about one-fourth inch. One figure shows a cross-section of the trap, the arrows indicating how the flies enter the bait pan and then ascend through the opening above into the large receptacle. These contrivances were, before we were aware of it, painted a dark green by the carpenter, but this appears to be no obstacle to their usefulness.

The bait is a very important factor in using this trap. *It should always consist of bread and milk and be frequently renewed.* That is, it should not be allowed to dry up and consequently lose its attractiveness. The flies in the upper part, or receptacle, should be killed by immersing this part of the trap in hot water or pouring boiling water over it, or in any other way devised by the user and not injurious to the trap itself.

Digitized by Google

These dead flies may be emptied out of the trap, the bait renewed and the trap reset.



We append herewith the result of several different days' use of the trap illustrated. These results were reported to the Chief of this Division by Mr. Dan Nelson, an employe, who was placed in charge of the traps with directions to keep a careful record of the flies caught: Dairy barn, one day, 1,700 flies; two days, 2,000 flies; dining hall, rear of building, two days, 3,000 flies; same place, two days, 3,000 flies; same place, five days, 13,000 flies; dairy barn, two days, 1,800 flies; dining hall, rear of building, three days, 6,000 flies; same place, three days, 5,000 flies; same place, one day, 4,200 flies; on the back porch of a dwelling house not far from a stable containing a few horses, two days, 8,700 flies; same place, one day, 12,000 (twelve thousand) flies; same place, one and a half days, 18,800 (eighteen thousand eight hundred) flies.

We wish to again emphasize the importance of using bread and milk for bait and renewing the same frequently. On the few occasions we have been told the Hodge fly trap has not been successful we have always found upon inquiry that some bait other than the one recommended had been used. Tainted meat is also very attractive.

In view of the success of the contrivance described above and its consequent usefulness, we propose for it the name which is used at the head of this article.

GARDEN HELPS (Continued from page 399.)

Lilium Auratum, the well known golden banded lily, is a rare flower when successfully grown, but will not thrive indefinitely, as some of the others do, as a microbe attacks it, usually killing it at the end of three or four years. Of course many are more fortunate and keep them longer, but even though they require frequent replanting they are well worth the trouble and expense. The bulbs when received should be buried in sand until planted, as they decay with exposure to the air.

Mrs. Ely, in her garden book, gives the following formula for mixing the ideal soil for lilies: 1 wheelbarrow of leaf mold, 2 wheelbarrows of garden soil, 2 coal hods of wood ashes, ½ wheelbarrow old, well rotted manure, 2 spades of bone meal.

The editor wishes to thank the following for valuable data in actual planting furnished her in the preparation of this article: Mrs. H. A. Boardman, Mrs. D. Webster, Mr. Charles Ramsdell, Mr. Charles Nordine, Mr. H. F. Baker, Mr. Lindsay.

☞Will not our readers send reports of the new things tried in the garden this year? We are just as anxious to hear of the novelties that fail as of the successes. Send before the tenth of October, for the November magazine.

Digitized by Google

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by Mrs. E. W. Gould, 2644 Humboldt Avenue So., Minneapolis

The two prime requisites for success in raising lilies seem to be good drainage and a mellow, rather light soil. If the soil contains much clay, it should be removed and replaced with sandy loam. One authority says that the bed should be well supplied with decaying vegetable matter, such as leaf mould, rotted sod, very old manure, or decayed lawn clippings. But the bulb must not come into contact with any of these. Bone meal can also be used and is good as it contains the requisite plant food and disintegrates slowly.

It is a safe thing in planting to place the lily bulb on a layer of sphagnum moss or of sand, an inch or more deep, and to fill in about the bulb with sand, thus insuring good drainage and making it impossible for it to come in contact with any of the decaying vegetable matter.

These lovely flowers will do well in partial shade, but care must be taken that they are not in a damp situation nor near very large trees. They do well planted among shrubbery and hardy perennials, the foliage of which adds to their beauty, as they need the green background to appear at their best—but see to it that room is given them to increase, and that the bed is well drained.

Most lilies do best when planted in the fall. They should be planted as soon as possible after being received, as they do not like to be out of the ground long. The Japanese understand this and wrap the bulbs in clay before shipping them any distance. As a rule they should be planted six inches deep and twelve inches apart, though some of the smaller varieties would require less depth and space. After planting a liberal mulch of lawn, clippings should be applied to the bed; two inches will not be too thick. This will prevent the loss of moisture from the soil and is not so dense that the lily sprouts cannot push through it as they appear.

A liberal covering of litter or strawy manure should be applied after the ground freezes. This can be removed after danger of frost is over in the spring. Beyond mulching and fertilizing, lilies require very little attention after planting.

Lilium tigridum, the old fashioned tiger lily, is without doubt the hardiest of all, and will live for years, its height depending upon the richness of the soil.

Tigridum splendens, an improved variety, is rich scarlet with black spots.

Lilium elegans is a hardy variety, bearing flowers from yellow and orange to red, and stands next to Lilium tigridum in hardiness and general garden use.

Lilium superbum and *Lilium canadence* both show good records in point of hardiness, flowering about June 15th.

Hemerocallis and *Funkia* are both true lilies and should be in every garden.

Hemerocallis flava, the *Lemon lily*, and *Hemerocallis fulva*, the Tawny Day lily, are old time garden favorites and among the most popular garden perennials, coming up for years without being replaced.

Funkia subcordata is a fairly hardy white and blue white lily.

Funkia grandiflora, the large white plaintain lily, has not proved hardy in Minnesota.

The Funkias and Hemerocallis are best planted in early spring in this climate.

Lilium candidum, the Madona lily, is a beautiful pure white lily blooming in June. This lily requires full sun, and must be planted early in the fall as it makes a growth then. The bulbs should be dusted with sulphur and covered to the depth of two inches.

The Speciosums, *album* and *rubrum*, are most beautiful, not as hardy as some of the above mentioned lilies, yet I personally know of a bed of the rubrums that has flourished and increased for seven years, on the southwest side of a city house. The bed receives the same protection as the perennials do in the fall. These are such beautiful lilies that they should be planted even though replanting is often necessary. These lilies will do well in partial sun.

(Continued on page 398.)

SECRETARY'S CORNER

AN EASTER LILY IN SEPTEMBER.—After a successful experience for two seasons, in securing a second crop of Easter lilies from bulbs that bloomed at Easter, I am wondering why these bulbs are thrown away after the first crop of blossoms are secured from them. This year, after Easter, when the top to our lily had died down, I took it from the flower pot and transplanted the bulb in the garden. On the 8th of this month (September) it bloomed again, and we now have it in our living room with three large, beautiful blossoms which fill the air with their exquisite fragrance.—Arthur E. Haynes.

HARDY PEAR SEEDLINGS—Rev. Jno. B. Katzner, operating a trial station at Collegeville, in a recent letter speaks of sixteen very hardy pear seedlings which have survived the past winter out of the hundreds that were growing at his station. These sixteen seedlings have lost only a terminal bud and are making a good growth this year. Many other pear seedlings which froze back two or three inches are also doing well. The Alpha grape, of which Mr. Katzner has spoken occasionally in reports from his station, did not kill back any last winter, while the Beta was considerably injured at his place. He reports this variety as very healthy and growing and bearing well this season.

SEPTEMBER SUPPLEMENT.—Dear fellow member, did you notice the yellow supplement which was contained in the September number intended to be used by the members in sending information to this office on points of vital importance in connection with the orchard interests of the state? If enough of these reports come in upon which to base conclusions, the facts they present will be collated and given to our membership a little later, probably at the annual meeting. While a goodly number of reports have been received, yet many of those who have had the largest experience in this direction have failed to return this supplement. It is a small matter for each one to fill this out, and the results which we are looking for will be an increase of knowledge and a larger certainty of facts, which will be a common benefit for all of our membership. Please take this matter up and return this supplement promptly. This means YOU, not your neighbor!

HAVE YOU A FRUIT CELLAR?—In the August number is presented a well worked out plan for the construction of a concrete fruit cellar that every farmer, and commercial fruit grower as well, should certainly have on the place. You will be surprised to see how well you can keep Wealthy apples if you have this kind of a place to store them in, and other fruits and vegetables as well. Vegetables, however, put in the same compartment with fruit are likely to affect the quality of the latter materially. There should be an air-tight partition between the two. If you have such a fruit cellar you can store therein the fruit you purpose to exhibit at the annual meeting and bring it to the meeting with you instead of sending to cold storage, which would make it possible for each member attending who is growing fruit to bring a few plates of fruit with him in a satchel instead of going to the expense and trouble of sending to cold storage.

Digitized by Google

Digitized by Google

MR. T. E. PERKINS, OF RED WING, IN HIS MALINDA SEEDLING ORCHARD.

Digitized by Google

☞After reading this magazine, will you please pass it along to some friend who will appreciate it and whom you may perhaps interest to become a member of the society—at least he should derive benefit from its reading. By distributing in this way the twelve magazines received during the year 1911, at the beginning of the next year—upon renewing your membership in the society—you will be entitled to receive postpaid a cloth bound volume containing all the magazines for 1911 and much other interesting matter, with a full index of all its contents, entitled "Trees, Fruits and Flowers of Minnesota," a handsome book for your library and invaluable for reference.

THE MINNESOTA HORTICULTURIST

Vol. 40. **NOVEMBER, 1912.** **No. 11.**

Apples for Commercial Orchard, Their Planting and Care.

G. A. ANDERSON, FRUIT GROWER, RENVILLE.

Until very recent years but little attention has been given to the commercial side of apple growing in Minnesota, consequently there has been very little discrimination shown in selecting varieties for planting, as what few apples were left after the farmers had enough for their own supply could easily be disposed of in a near-by market without much regard to the variety, quality or appearance of fruit; but the past season, especially with many young orchards coming into bearing and the heavy crop in general in the southern half of the state, and a consequent glut of some varieties during the fall months, has fully convinced me, and, I am sure, a great many other growers, that we should be very careful when planting commercial apple orchards to select such varieties as have a standard market value, with good quality, size and color.

It is useless for us to grow a dozen varieties of apparently the same season of ripening. We should select the best one or two varieties that ripen at the same time and that are known to sell well in the markets we cater to, and our financial returns will be far better than if we grew the dozen varieties ripening at the same time. We will invariably find that a shipment consisting of one or two good varieties will bring better returns than if the shipment consisted of a dozen varieties.

In regard to the best varieties to grow I will not attempt to name any definite list for the entire state, as conditions may differ in different parts of the state, certain varieties may do better in one locality than in another, and market conditions may be different and demand certain varieties. Therefore in giving the varieties I consider best from a commercial point of view, if I step rather hard on some one's favorite apple, don't think I mean the varieties I mention are the only

Digitized by Google

ones to grow, regardless of other conditions, which may be as important as the variety.

For a very early apple the Yellow Transparent and Tetofsky have given me very good returns. These varieties are ready for market some two weeks earlier than Duchess and always bring a good price. The trees are hardy and good bearers.

After these are gone I prefer the Duchess, which is a good tree in every respect, a good bearer of nice, large apples, which are splendid for cooking and baking purposes, what is wanted at the time of year they are ripe. It is also an apple well known on all markets. Now we have such varieties as Charlamoff, Okabena and others of practically the same season of ripening. I find the Duchess far superior to them. I have found the Okabena to be rather a shy bearer, and if it bears a fair crop the fruit is inclined to run a little small.

By the time the Duchess are gone we want some variety for late fall and early winter. For this I name the Wealthy, which I consider the best and most profitable apple grown in the state today, and I am sure if a vote were taken here of the most profitable apple to grow in Minnesota the Wealthy would be far in the lead. To be sure it is not a long keeper, but it will keep in good condition for at least two months after picking, which gives one ample time to dispose of them, and they always sell well in most any market. The trees are perfectly hardy. I have trees twenty-five years old that have never winter-killed and are in perfect condition today. They are also early and heavy bearers.

We have the same season of ripening such varieties as Patten's Greening, Peerless, Wolf River, Longfield, Hibernal and others, but they are no improvement over the Wealthy, in fact, not as good in most respects. The Hibernal I consider worthless, as it is a poor bearer, of poor quality, and cannot be sold where they come in competition with the Wealthy. I should like to see it discarded from our list and not recommended unless it be for the far north where no other apple will grow.

Now for a variety of winter apple. So far I think we have none thoroughly tested that are grown with perfect success. I think, however, that among our many winter seedlings there may be some varieties to fill the place of a winter apple. I have a winter seedling, the fruit of which keeps in perfect condition in a cellar until June 1st. Fruit is of medium size and good quality. The original tree is some eighteen years old and has never winter-killed any. The Northwestern Greening, with me, is proving a failure, the trees are weak and short-lived. The Walbridge has done fairly well but is too shy a bearer.

Digitized by Google

My list, as mentioned, would be Yellow Transparent, Tetofsky, Duchess and Wealthy, with Wealthy constituting at least 75 per cent of the planting until we are sure of a good winter variety, one that will keep the entire winter in an ordinary cellar.

In the planting and care of a commercial orchard I think most of us make the mistake of planting our trees too close together for best

A Patten's Greening apple tree in first fruitage.

results. In order to grow clean, well-colored fruit, trees must have plenty of room to admit of air and sunshine, for without sunshine fruit will be of poor color and quality. Twenty by twenty-five feet is none too far apart, and for some varieties twenty by thirty feet would be better. Good, healthy two or three year old trees should be planted and cultivated for some four or five years until they are well established.

Digitized by Google

Now I come to a point where we do not all agree—about cultivating or not cultivating the bearing orchard. We cannot lay down a rule that will be best and safe to follow for all parts of the state, because the grass and mulch system has been a perfect success with me. I do not say it is the best system to follow in all parts of the state, regardless of soil and other conditions which may enter. In discussing this we should take into consideration the kind of soil we have. My soil is a rich black loam, with clay subsoil, and holds moisture remarkably well. On such soil we have to guard against too heavy growth and blight, which constant cultivation has a tendency to produce, while in some parts of the state where there is a light soil, with perhaps gravel for subsoil, constant cultivation may be the best system. Some will make the statement, "You might as well try to grow a crop of corn in sod as an apple orchard." There is slight comparison as an apple tree planted four or five years has roots that extend many feet down, while a corn plant feeds mostly from the surface.

My old orchard has been in sod for the past fifteen years, and my young orchard, nine years old, has been in sod the past five years, and both are in perfect condition today. There are many advantages in the sod and mulch system; you prevent the washing of soil, of which there will be more or less during heavy rains, where the orchard is cultivated. There is also never any danger of root-killing, as the grass even if left short in the fall catches the snow, which is the best protection we can have in an orchard during winter. Another great advantage of the sod system is, when the fruit ripens there will be more or less windfalls, and these, falling on the grass, can be picked up clean, whereas if the orchard is cultivated they will be covered with dirt, especially after a shower, which is generally the time we get our windfalls.

After we get our orchard into bearing and have a crop of fruit, an important feature is to market them to best advantage, but as that part does not come under the heading of this paper I will not discuss it. I will say, however, that I think the greatest detriment to marketing apples in our small towns is the farmer who has only a few bushels of fruit to sell. He will not take the time to pick and handle them properly, and they are brought to market in very bad condition. The merchant feels that he is his customer and that he must buy his fruit, no matter what condition it is in. This often results in a glutted market, and less fruit will be sold than if it was brought to market in good condition.

Digitized by Google

In closing, will say if the right varieties are selected, properly planted and cared for, I am firmly convinced that a commercial apple orchard in Minnesota is a profitable investment.

Mr. McCully: How much of a mulch do you use, Mr. Anderson?

Mr. Anderson: I cut the grass twice a year and leave it right in the orchard.

Mr. Baldwin: I wish you would add the Faribault to this list of winter varieties. I like that crab, and there is a place for it in this list.

A young Duchess apple tree.

The President: Mr. Anderson, have you ever tried the Faribault crab?

Mr. Anderson: No, sir, I have not.

Mr. Philips (Wis.): We are passing out of the crab stage.

Mr. Kellogg (Wis.): What is the matter with Patten's Greening and McMahon's White to put in a few car loads between the Wealthy and the Duchess?

Mr. Anderson: By the time the Duchess is gone the Wealthy is ready to pick.

Mr. Tingley: How do you like the Lowland Raspberry?

Mr. Wedge: I think the Lowland Raspberry is one of the finest fruits we can grow in the north, and we let a good deal of our privileges escape when we allowed this variety to be introduced by Stark Bros., of Missouri, way down in the south. An apple that is recommended as far south as that is certainly very valuable with us, and as to hardiness I think the Lowland Raspberry is probably as hardy as the Wealthy. However, I do not think it is recommended for commercial purposes on account of not being prolific enough. It is a variety that stands up well with the Wealthy and the Patten's Greening, but it is a shy bearer and does not ripen all at once, but that makes it all the more valuable for a small orchard. It is rather small sized, although some of them will average with the Wealthy.

Mr. Yanish: The speaker in his paper referred to the Okabena as being a shy bearer. My experience is directly the opposite. I have some trees, three, five and seven years old, that bear too heavily with

Digitized by Google

me. The three year old trees had a great many apples on this year, and the five year old trees were loaded so heavily, some of them, that I had to remove part of the apples. Some of the trees planted three years had a heavy crop.

Mr. Clausen: Speaking of the Lowland Raspberry makes me think of an apple that I want to tell you something about. I have an apple that is overlooked. It is so much like the Lowland Raspberry that this summer I sent one down to Stark Bros., in Missouri, and they called it the Lowland Raspberry. You remember that they introduced or recommended the Lowland Raspberry for this country. I had a letter from them in which they insisted that it is the Lowland Raspberry, and I insist that it is not. I can see the difference, but I think it is so like the Lowland Raspberry that it might well be mistaken for it, and that is how it comes that Stark Bros. claim that it is the Lowland Raspberry. I call it the Summer Banana, or Stark's Summer Banana. It is a better bearer than the Lowland Raspberry, but I think it is an apple that has been overloooked. I had it in cold storage, and it kept well until now. It is about the same size as the Lowland Raspberry. I think it is an apple that will come in just where the Lowland Raspberry will come in. It is about the same quality as far as I can see. I would like those of you who are interested in the growing of apples to see the apple that I have.

Potatoes should always be planted immediately after being cut. In some sections of Ontario it has apparently become the custom to leave the potatoes a few days before planting, believing that an advantage is obtained thereby. This practice was probably originated by cutting the potatoes on a rainy day or on a Saturday when the children were home from school, and the sets were kept a few days before planting, and the results have apparently been good. As the result of some ten years' experiments at the College and five years' co-operative experiments throughout Ontario it was found that potatoes which were cut and planted immediately gave an average of about fifteen bushels per acre more than those which were cut four, five or six days before they were planted.

If the land is a sandy loam the potatoes can be planted to a depth of four or five inches and the land cultivated on the level. If the soil is a heavy clay, however, it is probably better to plant to a depth of only about three inches and to slightly ridge or hill the land at the proper stages in the growth of the potatoes. In experiments conducted for ten years on an average clay loam, the yield was practically the same from level and from ridged cultivation.

Experiments have been conducted carefully by planting potato sets in drills about twenty-eight inches apart with the sets a foot apart in the rows in comparison with the planting of the same amount of seed in rows thirty-three inches apart both ways. Considerably larger yields were obtained from the closer planting.

It is found to be a detriment to use more than one set in each place, as for instance, one potato set two ounces in weight is likely to give a larger yield of potatoes than two sets of one ounce each which are planted close together.—Canadian Horticulturist.

Digitized by Google

Sulzer Apple Packing and Grade Bill.

SIGNED BY THE PRESIDENT AUGUST 3, 1912.

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that the standard barrel for apples shall be of the following dimensions when measured without distention of its parts: Length of stave, twenty-eight and one-half inches; diameter of head, seventeen and one-eighth inches; distance between heads, twenty-six inches; circumference of bulge, sixty-four inches outside measurement, representing as nearly as possible seven thousand and fifty-six cubic inches, provided that steel barrels containing the interior dimensions provided for in this Section shall be construed as a compliance therewith.

"Sec. 2. That the standard grades for apples when packed in barrels which shall be shipped or delivered for shipment in interstate or foreign commerce, or which shall be sold or offered for sale within the District of Columbia or the Territories of the United States shall be as follows: *Apples of one variety which are well-grown specimens, hand picked, of good color for the variety, normal shape, practically free from insect and fungous injury, bruises and other defects, except such as are necessarily caused in the operation of packing, or apples of one variety which are not more than ten per centum below the foregoing specifications, shall be 'Standard Grade minimum size two and one-half inches,' if the minimum size of the apples is two and one-half inches in transverse diameter; 'Standard Grade minimum size two and one-fourth inches,' if the minimum size of the apples is two and one-fourth inches in transverse diameter; or 'Standard Grade minimum size two inches,' if the minimum size of the apples is two inches in transverse diameter.*

"Sec. 3. That the barrels in which apples are packed in accordance with the provisions of this Act may be branded in accordance with Section two of this Act.

"Sec. 4. That all barrels packed with apples shall be deemed to be below standard if the barrel bears any statement, design or device indicating that the barrel is a standard barrel of apples, as herein defined, and the capacity of the barrel is less than the capacity prescribed by Section one of this Act, unless the barrel shall be plainly marked on end and side with words or figures showing the fractional relation which the actual capacity of the barrel bears to the capacity prescribed by Section one of this Act. The marking required by this paragraph shall be in block letters of size not less than seventy-two point one inch gothic.

"Sec. 5. That barrels packed with apples shall be deemed to be misbranded within the meaning of this Act:

"First.—If the barrel bears any statement, design or device indicating that the apples contained therein are 'Standard Grade' and the apples when packed do not conform to the requirements prescribed by Section two of this Act.

"Second.—If the barrel bears any statement, design or device indicating that the apples contained therein are 'Standard Grade' and the

Digitized by Google

barrel fails to bear also a statement of the name of the variety, the name of the locality where grown and the name of the packer or the person by whose authority the apples were packed and the barrel marked.

"Sec. 6. That any person, firm or corporation, or association, who shall knowingly pack or cause to be packed apples in barrels, or who shall knowingly sell or offer for sale such barrels in violation of the provisions of this Act, shall be liable to a penalty of One Dollar and costs for each such barrel so sold or offered for sale, to be recovered at the suit of the United States in any court of the United States having jurisdiction.

"Sec. 7. That this Act shall be in force and effect from and after the first day of July, nineteen hundred and thirteen."

EXPLANATORY NOTES

The Package.—The size of the barrel will be found in the first paragraph, and is now in general use in the barreled apple sections.

The Grade and Sizes.—These specifications are found in Section 2. *There is but one grade. This grade is divided into three sizes governed by the minimum size of the apples in each grade.* A limit of tolerance of ten per cent is provided to allow for errors in packing. This means that if you are not more than 10 per cent below the specifications, your pack is deemed up to the legal standard.

For example, if you pack your apples *"Standard Grade Minimum Size two and one-half inches"* then the apples in the barrel must be *"apples of one variety, well grown specimens, hand picked, good color for the variety, normal shape, practially free from insect and fungous injury, etc."* (See Sec. 2), or not more than 10 per cent below these specifications, and must not be *less* than 2½ inches in transverse diameter. *They may be as much larger as you desire.* Exactly the same principles apply to the 2¼ inch and 2 inch size.

Branding.—All barrels marked "Standard Grade," etc., must also have branded upon them (1) *the variety,* (2) *the name of the locality where grown,* (3) *the name of the packer or person by whose authority the apples were packed and the barrel marked.* (Sec. 5, sub. second.)

The brand on the head of the barrel should read something like this:

Standard Grade Min. Size 2½ inches Baldwin Grown in Western New York Packed by John Jones St. Louis, Md.	or	Standard Grade Min. Size 2½ inches Baldwin Grown and Packed by John Doe, Rochester, N. Y.

An opinion from the Acting Solicitor of the U. S. Department of Agriculture also advises us that the following or similar words may be used as a part of the brand, "Packed in Accordance with the Act of Congress approved August 3d, 1912."

Digitized by Google

These words may be worked into a small rubber stamp and should lend strength to the brand. As the law has not yet gone into effect, you are advised to use "Packed in *Accordance* with," etc., rather than "Packed *Under* the Act of Congress," etc.

Time of Taking Effect and Penalty.—The Act does not go into effect until next year, but the Solicitor advises that we are at liberty to pack, brand and act in Accordance with it RIGHT NOW. Also while the specific penalty prescribed in the bill may not attach until next year, *yet all apples, no matter how marked, now fall under the power of the Food and Drugs Act.* If you pack in the OLD way and brand the barrels Fancy or No. 1, etc., and the fruit does not conform to the brand, you still come squarely under the Food and Drugs Act.

You are, therefore, advised to see to it that *all brands of every description are in accordance with the facts,* whether you follow the Sulzer Bill or whether you do not.

SAMPLE CONTRACT UNDER THE SULZER BILL.

THIS AGREEMENT, Made this.....day of.....1912, WITNESSETH, that *John Jones, of Winchester, Va.,* has sold to *Richard Roe,* of *New York, N. Y.,* his crop of standard grade apples to be delivered at the railroad station at....., or at the..... storage at.....; said apples to be packed in standard barrels and graded according to the specifications established by the Act of Congress, approved by the President August 3rd, 1912, and known as the Sulzer Apple Package and Grade Bill. Richard Roe agrees to pay therefor upon delivery as follows:

(1) For Standard Grade Minimum Size 2½ inches in the following varieties .....$.....per Bbl.
(1) For the same grade and size in the following varieties .....$.....per Bbl.
(2) For Standard Grade Minimum Size 2¼ inches in the following varieties .....$.....per Bbl.
(2) For the same grade and size in the following varieties .....$.....per Bbl.
(3) For Standard Grade Minimum Size 2 inches in the following varieties .....$.....per Bbl.
(3) For the same grade and size in the following varieties .....$.....per Bbl.

Signed.....
.....

On the reverse side or at the bottom may be printed Section 2 of the Act and the further statement contained in Section 5, Subdivision 2, that the barrels must be branded with the name of the variety, the locality where grown and the name of the packer or person by whose authority the apples were packed. This Contract is in its simplest form. Suitable blank spaces may be provided for the insertion of such other details as may be deemed necessary. Simplicity, however, is the best watchword.

Digitized by Google

Red Raspberries and Their Care.

O. H. SEAMANS, BERRY GROWER, EXCELSIOR.

First, select a piece of ground that the water does not stand on after heavy rains. Then sow to oats and seed down to red clover. After the grain is cut and the clover has got a good start, say about the middle of September, plow the clover under and let stand till the middle of October; then give a good dressing of well rotted manure and harrow in. In the spring, as soon as the ground is dry enough to be worked, give it another good harrowing and then you are ready for planting.

In planting, never put the rows closer than six feet, and put the plants three feet apart in the row. This gives plenty of room for cultivating and covering in the fall. If you have a very large piece to plant, make a marker which makes marks three feet apart; then plant in every other row.

Some dig the holes for the plant with a spade, but I have had very good success the last three years by taking a one-horse plow and making furrows to plant in, plowing as deep as possible and going twice in each row. The dirt falling back gives you loose dirt to set the roots in. If the weather is cloudy, it is all right to carry the plants in a basket while setting, but if it is clear and windy carry them in a pail of water. It is a good plan to have some one else carry the plants for you. Have them place the plant in the furrow, and you put a good shovelful of dirt on the roots and step on both sides of the plant, which makes the dirt firm around the roots and holds the plant up. Then in the afternoon, the last thing, plow the dirt back into the furrow. If the weather is dry, cultivate in a few days with a fine tooth cultivator. This keeps the ground from drying out.

The next question is, what shall I plant in between the rows the first year? I always plant potatoes. The rows being six feet apart makes it just right for them. Never plant corn, as it shades too much. The first year is the most important. If you don't get a good stand, you might as well plow them up and try it over again the next year, as they never do well replanted in a patch the following spring.

Another important thing is to keep the plants free from weeds. Cultivate at least once every week or ten days all summer till late in August. You must cultivate them after they come into bearing the same. If you don't you will have weeds to wade through while picking. I always cultivate as soon as the berries are picked; then you will not knock off the berries while doing so.

Digitized by Google

In order to be sure of your plants going through the winter, they must be covered. We have a machine in our neighborhood to cover them, which will cover five or six acres a day, according to the condition of the ground. If you can't get a machine to cover them, bend them down, put enough dirt on them to hold them, plow a furrow on each side and finish with a shovel.

Now a few words about pickers. Always treat your pickers with kindness, and you will find it pays in the end. Never get the idea into your head that they are not human beings as well as yourself, and you will find nine out of ten of them ready to do a favor for you if you ask it. Don't forget that getting your berries picked is a very important item in raising berries for market.

Minnesota red raspberries at Hinckley.

Next, as to the variety of berries to raise. I have had every kind there has been since the days of the old Columbia of twenty years ago, which were dark and soft. Next the Turner, which were also soft. Then the Cuthbert, which was quite an improvement over the others, as it was larger and firmer, but winter-killed very easily. Then came the Marlborough, which was the best paying berry I ever raised. It was a good yielder, a good shipper and a very attractive looking berry, but they ran out about five years ago, and no one seems to have had very good success with them since.

About the time of the Marlborough came the Miller, which did very well. I still have them left, but they don't seem to do as well as they did eight or ten years ago. They are a very good shipper and bear late in the season if we have rain. We marketed them this year from the 20th of June until the 20th of August. Another good variety for a while was the Loudon. They were, I think, the heaviest bearer we ever had, but were very soft. They, too, have had their day and gone. About the time the Marlborough and Loudon

Digitized by Google

were going out of business came the King, which I am raising most of at present. They seem to be free from disease and are a good shipper.

Next, a few words about the life of a patch of raspberries. They should, if taken care of, last from five to six years from the time they start to bear. You will get the best crop the second and third years of bearing.

In conclusion, how to market your berries. I am a member of the Excelsior Fruit Growers' Association and have been ever since it was organized. I think it is a very good thing and saves us lots of bother and worry. We let our manager do most of the worrying for us. At present we have a very good manager, who has done a great deal for the good of the association. We are a long ways ahead of the old days when we used to get up at twelve o'clock at night and get ready to start for the market in Minneapolis in order to be there at five o'clock, maybe through rain, and sell our berries for $1.00 a crate. I think there will be more than one who listens to this that will remember those "happy days."

My Top-Working Experience.

E. G. E. REEL, FRUIT GROWER, EXCELSIOR.

When deciding to plant a commercial orchard, I began the study of top-working, as I wanted at least a portion of my orchard to be so managed. I wanted a variety known to be hardy and vigorous in the greatest degree top-worked to varieties of established merit.

Upon the recommendation of our helpful neighbor from Wisconsin (Mr. A. J. Philips) I planted 200 Virginia crab trees and root grafts of the same variety to graft to Wealthy. I had not then, nor have I now, the least desire to experiment, but from first to last kept the idea of a commercial orchard uppermost in my mind.

From the Wealthys and Peters in my orchard that bore earliest, I took scions with which to top-work the Virginia crabs. These had grown four years in the orchard and to such size that I worked only about one-third of the tree each season, thereby taking three seasons to fully convert them.

The best results came from grafting at least one foot from the crotch. The limbs to about one-third inch caliper were scarf-grafted; larger ones were cleft-grafted, and two scions in each cleft. I did not

Digitized by Google

notice that one method had any advantage as to certainty of growth, but the scarf when neatly made is far more sightly the first few years. The main cause of trouble seemed to be the weather, as those seasons when we had a number of freezes seemed worse. From 95% in good years to 50% in one when there were a good many severe changes was about the way my luck ran.

I worked some Jonathan on Duchess—two grafts to a tree—also some McWade Winter on Duchess. These bore fruit much smaller than the same worked on Virginia crabs, although the coloring on Duchess was finer. I have had the same variation in size and coloring in Peter, Wealthy, Northwestern Greening, Pattens, Gideon, Okabena and Yellow Transparent on the crabs and on their own roots.

I have many trees entirely converted to Wealthy and Peter. Especially noticeable is a block of 100 trees which is about as healthy and vigorous a lot as one would wish to see. I have quite a number wholly and in part converted to Northwestern Greening. My object in this was to get a hardier tree of that variety as well as improving the crotches. I consider the Northwestern Greening a poor proposition in any form—the evil day of crotching down is only delayed a few years. There seems to be no advantage in top-working the Pattens. That variety is perfectly hardy and vigorous enough.

The past season I tried some Delicious, King David and Liveland Raspberry—the latter a nice apple but of little value commercially as it is too soft, besides ripening so unevenly that it requires at least three pickings. However, I prefer it to Yellow Transparent on account of its very attractive appearance.

My Jonathans have been in six years, have borne three times and missed once (1910). They have never in these six years killed back, even in the terminal bud, excepting 1910, when they fared no worse than the Duchess and the crab upon which they were worked. I am told by Stark Bros., of Louisiana, Mo., that Delicious, King David and Stayman's Winesap are all as hardy if not hardier than Jonathon. If they prove to be so in our locality, they will be a valuable addition to our list of winter varieties.

My orchard proves, at least to my own satisfaction, that Wealthy on Virginia crab is far better than upon its own roots, and from the extreme vigor of that stock I have every reason to believe that it will make not only a longer lived tree, but one that will retain its vigor and ability to bring to maturity large crops of large apples through a long period. Six bearing years is too short a time to come to any fast and hard conclusion, and can only say, "'tis a consummation devoutly to be wished."

Digitized by Google

The Farmer's Fruit Garden and Orchard.

HENRY HUSSER, FARMER, MINNEISKA.

Before I start my subject proper I will try to imitate the platform speakers in telling a story. Mr. Jerome, a vigorous and healthy looking gentleman, sat in his garden telling incidents of his long life to his grandchildren, when a young city man approached the group and said, "Mr. Jerome, may I ask you what is the source of your health and strength up to your high age of eighty-four years?"

Mr. Jerome said, "You are welcome to follow me, and I will show you the secret of my health and my happiness." They went into a well kept orchard, the trees laden with fruits of all kinds, and Mr. Jerome said, "My friend, here is the fountain of my health, the treasure of my life. These trees I planted when I was young. I cared for them to the best of my knowledge, and they brought forth for me an abundance of beautiful fruit that never failed to attract buyers."

How many farmers' orchards are a source of wealth and pleasure to the eye? The most of them are an eye-sore and a harbor of insects and disease, and yet a farmer's fruit garden and orchard can be so managed as to be one of the strongest ties of the children to their home and a great help to the parents to raise their children to useful citizens, since it is a well proven fact that a boy who has an abundance of fruit to eat will seldom take to the abuse of liquor.

The farmer's fruit garden and orchard should be so managed as to have fresh fruit nine or ten months out of the year. We can have the strawberry from the middle of June or sooner up to middle July; black and red raspberries, currants and gooseberries follow in close succession, and the blackberry will finish the berry crop up in August. But long before the berries come to an end the tree fruits will give us their tribute. Cherries ripen in June and July, to the delight of man and bird, and plums of all kinds can be had during August and September.

But also the apple, the king of fruit, comes in midsummer already. Duchess will ripen in late June and July and last till the Wealthy is of useful size. The Wealthy, by proper handling, can be kept till Christmas. The Fameuse, another bright red apple of excellent quality, also the Jewell's Winter, can be kept till January or February; the Northwestern Greening and Malinda can be grown to fill our wants on apples up into March and April.

Grapes can be grown to supply us all through September and October.

Digitized by Google

To have all this fruit it is necessary to manage the fruit garden and orchard so that the work can be done the easiest way. The plat should be laid out in long rows and the ground should be of such composition as to allow easy work, although too sandy soils should be avoided. For trees the soil should be loose four feet down to allow the

A McMahon apple tree in fruitage in Mr. Husser's orchard.

roots to grow down. Before planting any kind of fruit the ground has to be so prepared as to allow the soil to be packed well to the roots of plants and trees. To have the berry row about 200 feet long might be convenient.

Strawberries should be planted two feet apart in row and the rows four feet apart. Fifty Bederwood, 100 Senator Dunlap and fifty Glen Mary strawberry plants, all perfect varieties, when well worked, should give an ample supply for a family, about 200 quarts.

Digitized by Google

Twenty-five plants of Cumberland black raspberry, and twenty-five King or Sunbeam red raspberries, twenty-five currants and twenty-five goosberries will give a good supply when well worked.

Raspberries, currants and gooseberries should be planted four feet apart in the row and rows six feet apart.

One row eight feet apart from the others can be planted to one dozen blackberries, six feet apart in row, and one dozen and a half grapes, planted eight feet apart in row, to have a supply of grapes for a long time. The grape vine collection should consist of Beta, Worden, Concord and Moore's Diamond.

To get an apple supply from June till April the orchard should consist of about two Duchess, six Wealthy, six Fameuse, six Malinda,

Mr. Husser cleans out his strawberry patch.

and six Northwestern Greening. One Transcendent crab and one Hislop can be planted for the pickle supply. Six hardy plums, two De Soto, two Forest Garden, and two Wolf's Freestone, and in addition a few hardy hybrids of Japanese and native plums should give an ample supply of this fruit. Two Early Richmond and two Homer cherry trees should furnish enough for the family's canning supply. Last, but not least in importance, every orchard should contain some nut trees, since all boys like nuts, and if they can't get them at home they will trespass on the neighbor's land if he has any.

If trees are to do well, they have to be planted deeper than they stood in the nursery, and the ground has to be packed solid on and around, and the plants kept clean all summer. However, in apple trees it is safest to sow cover crop about August 1. Before approach of winter the grape vines have to be trimmed so as to leave about three

Digitized by Google

vines from this year's, cut back to three to five feet or longer on long trellises, and from these the branches sprout out on which grapes grow. Then they should be laid down and covered.

The strawberries have to be mulched, and on a level piece of land it is advisable to make furrows between the rows to help prevent sleet on berry plants. In an open winter trees also are benefited by mulching, but mulch should be worked into the soil in spring.

The young trees have to be protected against mice and rabbits with strips of burlap wrapped around them. Many farmers might say, who shall work, prune and spray the orchard. My answer would be, those that eat the fruit. Children are the greatest fruit eaters. Let your children do the work under your guidance; let them have the full benefit of the orchard; give them a chance to know not only what you know, but all that is new and helpful in fruit growing. Since our public schools in the country instruct our children in a most forcible way to be drawn to city occupation, it is necessary that they be supplied with the necessary instructions in some other way, that is, by good books and magazines, but in a more forceful and fruitful way it can be acquired by getting the horticultural short course of our agriculture extension department into your nearest town. Lastly I would say let them join the ranks of the never tired, sober-minded, hard-working body of men and women that has done so great for the development of fruit trees and flowers, our State Horticultural Society.

Col. Burnap (Iowa): If anybody contemplates setting an orchard in black prairie loam I would suggest that they do not set the Walbridge.

The President: It does very well along the river, but on bleak prairie loam it does not do so well.

Mr. Husser: I live close to the river, and I have seen the Walbridge do exceedingly well there, but I have no knowledge of what it will do elsewhere.

Mr. Philips: There are some Walbridge trees along the river at Winona, and they are very valuable. In a situation like that, on the bluffs along the river, the Walbridge is all right.

Mr. Wheaton: I have a Walbridge tree twelve years old doing very well, and that is out on the open prairie.

Col. Burnap: How does it bear?

Mr. Wheaton: It has not borne much.

Mr. Husser: The Longfield is a very valuable apple, and I would advise a farmer to plant a few Longfields, because in the third year he will get a good supply of apples. A farmer should have only a few standard varieties of apples, and he will have no difficulty in growing them.

Mr. Philips: One Longfield is worth more than a Duchess.

Mr. Larson: Has anybody tried the use of dynamite in setting trees, that is in the way of loosening the soil in order to plant the tree in loose soil?

Digitized by Google

Mr. Philips: Mr. Granz, of Waukesha, has an orchard on very hard soil, and he made holes with dynamite in which to plant his trees, and he obtained very good results.

Mr. W. F. Richardson: Eight years ago I set out an orchard, this was the first I set out. I was instructed to set them twelve to sixteen inches deep. So I commenced to dig the holes in which to plant the trees, and I dug them quite large, about two and a half to three feet square. Those holes were three feet deep. Lots of people that went by while I was planting my orchard wanted to know whether I was digging my grave. After setting the tree in the hole I filled the hole with loam and put the tree on that, and then I put in about six inches of black dirt and tramped that down thoroughly, and then I put in a pail of water and let it settle, then I filled the hole full and tramped the dirt down well about the roots. I did not use any mulch

Mr. Henry Husser and wife among their flowers.

on top of the ground around the trees. These trees were set about eight years ago. Somebody else owns the land now, but I think those trees inside of four years have grown more than the average tree usually grows in eight. I would like to know whether anybody has had experience in digging holes large, and whether they had the same object in view as a man would have in loosening the ground with dynamite. I never saw anyone dig a hole that large in which to plant a tree, and I never have seen any trees grow as well as those did. I planted a hundred and sixty trees, and I do not think there was one lost out of that hundred and sixty. I put out last year five hundred more, and I do not think I lost one tree out of the five hundred. I planted them the same way, I dug the holes deep the same as I did for the first hundred and sixty trees that I planted.

Mr. Ludlow: I put out three hundred and twenty trees in about the same way, only I worked a horse instead of working myself digging holes. The land was in sod, and I plowed the land in strips twelve rods long, and then I made a dead furrow, and I aimed to have the dead furrow where the rows of trees were to come, and I threw the

Digitized by Google

sod out on each side, which left a place about two and a half feet wide where there was no sod at all. Then I took a double shovel iron beam corn plow and worked that ground. I put on two horses, and then I put a stone on the plow that weighed about fifty pounds, and I went through that dead furrow back and forth four times with that shovel plow, and I should think that the furrow was at least sixteen inches deep, loosening it up to that depth, and in the entire furrow there was no sod. Then I set out my trees, and I set them six inches deeper than they stood in the nursery. I put out three hundred and twenty of those trees, and they certainly are fine. Of those three hundred and twenty trees I set out I did not lose one. After that I put potatoes in between the rows. The fourth year I sold a hundred and two bushels of choice fruit from that orchard, and every tree in it is growing. Half of them are Wealthy, and the balance are Northwestern Greening, Patten Greening and Okabena. Of the Okabena I had one tree that was put in—I think it must have been four-year-old—into a bundle for a customer, and I knew that he was a careless farmer and could not take home so large a tree and make it grow, because a tree of that large size has not the same amount of roots that a small tree has, so I took it out of his bundle and put a smaller tree in its place. I trimmed about two-thirds of the top off, and at the same time it was loaded with fruit buds. I think I put those trees out on the 26th day of April, and four years after that tree matured twenty-four Okabena apples with which I took the blue ribbon.

Selecting Fruit for the County Fair.

J. M. LINDSAY, AUSTIN,

In selecting apples for county fairs precaution should be taken in selecting the very choicest. This helps to make your county fair a success and brings due credit to the person exhibiting the fruit. There are four essential points to consider mostly: uniformity in size, color, freshness of the fruit and to leave the stem on the apple. Decayed fruit looks rather bad and lessens the quality of your exhibit. To avoid this in great measure the early fruit, such as early apples, crabs and plums, should be picked before they are too ripe and placed in cold storage.

In placing the fruit on the exhibit table they should be wiped off with a cloth, which gives them a bright, shiny look and adds greatly to the looks of the exhibit. Five apples should constitute a plate; eight to ten crab apples and plums should be required to complete a plate.

Care should be taken to not bruise the fruit when picking—handle them as though they were glass. *Do likewise when you pick to sell.* Have the apples look just as nice in the middle of the barrel as at the ends, and you will be rewarded in the next world as well as in this.

In selecting apples for exhibits a very good plan is to get paper sacks from your merchant. Have them large enough to hold five apples, write the name of the variety on a card, placing the card in the sack, leaving the card in same sack, and when you come to repack them to keep for some other exhibit or ascertain the keeping qualities at home you will find this a very good plan.

Digitized by Google

Interesting the Children in Horticulture.

S. H. DRUM, OWATONNA.

The public schools, and especially the high schools, have until recent years taught everything in the way of science except agriculture and its kindred subjects. During a conversation with a high school principal I offered to talk on horticulture to her pupils. Her reply was, "We don't teach botany in our schools."

One of my sons graduated from high school at the head of his class. The superintendent said to him: "What are you going to make of yourself? An old plug farmer?" "No," was the answer. That boy is now a civil engineer in the wilds of Canada. I had offered to send him to the agricultural school. So all the influence of the schools has been away from these things, notwithstanding it is the universal testimony of teachers that the best and brightest pupils are from the rural schools.

If you want to make a horticulturist you must "catch him young," while his interest in things is developing. Once get a child interested in raising fruits and flowers and explain some of the mysteries of propagation, and you have aroused an ambition and opened a path to greater things for him. You have widened his horizon.

To illustrate this, I will give some of my own experience in the way of interesting the children. My first attempt was merely to help in the closing exercises of a rural school. I took with me a few branches of apple and some wax and showed them some of the easier ways of top-working, gave apple seeds to each child in the winter and told them how to plant in cans in the windows the same as early tomatoes. I gave a short history of the Wealthy apple. I showed how yearling seedlings may be top-worked on bearing trees and thus much time saved in getting results.

Encouraged by the interest shown, I offered to talk to other schools on this subject, and everywhere met with a cordial reception.

Later in the spring I carried some apple and plum blossoms and showed the different parts of the flowers, the male and female parts and their names, showed that plums and other stone fruits have only one pistil while apples have five. I cut an apple around showing the seed cells. I gave small quantities of grafting wax to the school children and later showed some of them my grafts and went into their orchards inspecting their work and exchanging scions with them. As to results, I have no means of knowing in many of the schools, as they are many miles apart, but in one of them the teacher and scholars

Digitized by Google

top-worked some tame plums scions on wild plum sprouts in the school yard with success.

I visited a school in Steele county last winter, giving a talk on horticulture. Four of the ten children from this county who attended the short course in agriculture last spring were from this school. I don't take the credit in this case, as the teacher is wide awake and progressive in agricultural work.

One of these boys, who was inclined to shirk his studies and prefered to study nature at first hand, has waked up and has established what he calls his experiment station in his father's orchard. From this boy of fifteen I received scions of Rhode Island Greening and Cathcart that were grown on his grandfather's old place in Connecticut.

I have frequently heard the old veterans in horticulture bewail the fact that so few young men attend their meetings. I believe I have found one way to not only recruit the horticultural society, but to improve the youth, for I believe that, next to religion, horticulture tends to elevate the character and make the life clean.

I have done this work partly from the teacher's habit of telling things, partly from a love for the children and lastly a desire to make this world a little better place to live in. For surely the way to make the world better is to train the children in good citizenship and right living. Showing them some of the beauties and mysteries of horticulture will tend to interest them in wider fields of thought and usefulness. As "it is the new wood that bears the fruit," so the children will be the fruit bearers of the next generation, and their fruit will be good or bad according to the faithfulness of their parents and teachers in cultivating their minds and hearts, training them in "the way they should go—and when they are old they will not depart from it."

Mr. Kellogg (Wisconsin): About fifteen years ago one of my girls was teaching school here in the city, and she wanted me to furnish her children with some root-grafts. I sent her some, and when the children took them home, they set them out, and pretty soon the children said, "Teacher, I am going to have an apple." They saw that their trees had begun to bloom, and of course they expected fruit. Now, in regard to evergreens, there is quite a vague idea among people generally as to the size of an evergreen tree. A two-year-old evergreen tree is about two inches high, but most people think that a two-year-old evergreen tree ought to be about the size of a two-year-old apple tree. I think if teachers would take a little interest in this horticultural department it would certainly be a great thing for the children and would awaken an interest in horticulture that could not be otherwise awakened.

Mr. H. V. Poore: We certainly ought to take more interest in this subject than we do. I was in a little town not long ago and

Digitized by Google

called the attention of the owners of certain property to the fact of how nice it would be to have some apple trees. But they said, "Oh, what's the use to have apple trees? The boys would get all the apples." A little fellow came up just then, and I said, "Charlie, if there were apples on a tree here in town, would you take them?" He said, "No, sir, I would not." If he had the privilege of taking apples he would take them, of course, but if the fact is impressed upon him that by taking an apple it would destroy or injure a tree, or that it would be wronging somebody, he would not do it. The streets of our towns are filled altogether too much with cottonwood, box elder and trees of that description that do not last long and do not make a good appearance. If fifty people in a community would each plant an apple tree on the street, as it is done in some of the old countries, it would have a marked effect upon the minds of the children and would certainly turn their attention towards fruit growing. If we would plant fruit trees upon the streets of our villages we would see less tobacco and beer signs. Would it not be much better to have a beautiful fruit tree to look at upon the street than the tobacco and beer signs that are constantly before the eyes of the poeple? If people were to understand how to grow fruit it would be almost an oddity to have a boy steal an apple, but now with the scarcity of that fruit there is nothing that suits a boy

A modern school house, built in Minnesota in 1907, at a cost of $1400. Light enters from north and west. Cut shows building before any planting was done.

Digitized by Google

better than to sneak around some night and steal apples. I have no trouble with having fruit stolen. I tell the boys to come to my orchard and help themselves. They know it, and there is no fun in stealing from anybody when they know they are welcome to all the fruit they want when they come there without stealing it. Why can't we make children and even grown people just as familiar with a certain kind of apples as they are now familiar with a certain brand of tobacco or a certain brand of beer?

I was talking with a young man yesterday in this city who had come from the farm. I was just wondering why we see so many people interested here in horticulture who are gray like myself, and why we do not see more children and young people interested in this work from twelve years up. If you ask them about it they say it takes too long to realize results from an apple tree. The attention of children and young people generally is constantly called to some kind of cigar or some brand of cigarettes, that is constantly before their eyes, and why can't we do something in the line of horticulture to impress upon the minds of the young people the qualities of good fruit, the quality of a certain apple, and get them to grow and eat fruit instead of smoking cigarettes? This young man I was speaking about was smoking a cigarette. I asked him where he learned to smoke. He said, "I learned to smoke in some hotel. What is there in life worth living any way if we don't have these comforts?" That was his viewpoint of the enjoyments of life. How much better would it be to call the attention of the children and young people to the enjoyment of good fruit rather than cigarettes! (Applause.)

Mr. Husser: I think the horticultural society has a great mission to perform. Every member of this organization knows that the education of the children is the most important feature in solving this problem and having the children grow up to be good and useful citizens. If every horticulturist would make the start in his own home, interest his own children in horticulture, with the knowledge he can himself impart and with the aid of books and literature he should certainly be able to interest the child. Then give the child a piece of garden for his own, let him have the income from it, and let him have what he makes to use as he pleases within a reasonable limit, and I think you will find no difficulty in interesting a child in this manner. If that child grows his own fruit and vegetables and is allowed to sell them and have the money that he makes from it to spend as his own, he feels that he is becoming independent, he feels proud of what he can do, he will imitate his elders, so that in a general way he is stimulated to do something good and useful and eventually become a useful citizen.

The President: We all know that children are apt to do or want to do what their elders do, and if we take an interest in this matter and try to teach the children what we know it should not be difficult to get the children interested.

Col. Burnap: Now, while we are on this subject, I want to say that a child spends a good share of its life in the school room, and if we expect to accomplish anything along this line we must also get

Digitized by Google

the teachers interested. That is the trouble. The children may be all right, they may be willing to learn, but the teachers must first be interested so they will be willing and able to teach the children. In our county we had a good, bright young man for county superintendent, and he said, "I want to get the children interested in horticulture, Mr. Burnap, and how am I going to do it?" I said I didn't know, but we talked the matter over a little while, and finally concluded that the best thing to do would be to interest each teacher in the subject of strawberry growing, and I told him that if he could get the teachers together I would teach them when it came time to set out strawberries. I had a large bed of a great many varieties of strawberries, and I said I would explain the difference between the pistillate and the staminate varieties and that I would give them all the plants they could use in school in demonstrating the planting and care of strawberries, and that they could set them in beds for the purpose of teaching the children; I thought it would be a good thing to teach the children in that way how to grow strawberries. He was very much interested, and said, "Are you going to have plants enough?" I told him yes, I would have plenty. Finally the day came when they should have come to the school house for the instruction I had promised to give them, but it was on Saturday, and there was a show in town that afternoon, and every one went to the show. (Laughter and applause.)

Mr. Philips (Wis.): I have had a little experience in that line myself. I found that you not only have got to have the right kind of a teacher, but you have got to have the right kind of a mother if you want the boys and girls to take an interest in horticulture.

Col. Burnap: The father helps some.

Mr. Philips: Well, not much. A boy came to me one day and asked if he could have some apples. I told him yes; I told him to fill his pockets. He filled his pockets as full as he could get them and went home. The next day I met him on the street, and I noticed that he was in pretty bad shape. I told him to empty his pockets, and he did. Evidently, when he went home the night before with his pockets full of apples, and his mother found that I was so willing to give them away, she became impressed with the idea that there was something in it, and she went to work and made him a pair of overalls and made the pockets clear down to the bottom. I made him take his overalls off and empty them out, and I found he had a little over half a bushel of apples. (Laughter.) Now, that boy didn't have the right kind of a mother.

Mr. Underwood: I think the whole trouble in the matter of educating children lies in our public schools. What are we maintaining our public schools for? We boast of our educational advantages in Minnesota. Minnesota has the largest educational fund of any state in the Union, and how many schools are there that teach the children anything about horticulture? They know absolutely nothing about the names of the most common plants and weeds they see every day. I was asked at one time a few years ago to plant trees in our school grounds. While I was at the school one of the teachers remonstrated with me for planting trees and spoiling the grounds, because she said the chil-

Digitized by Google

dren needed the grounds for a playground. I told her, certainly the children ought to have playground, and I knew that there was plenty of room left after planting the trees for ample playgrounds. But I said to her, "Can't you make some use of the trees that I am going to plant out here as an educational feature for your scholars?" I said to her, "Do you know the name of any tree out on the lawn there?" She didn't know the name of a single tree, not even the name of a basswood, and she was a graduate teacher and sent there to teach the scholars. I tell you the whole trouble is with our public schools. If they would throw out nine-tenths of the stuff they are teaching there now and put in a reasonable and sensible currriculum, our educational system would be something we would have reason to be proud of.

Same building as on page 422. Cut shows what may be accomplished by judicious planting and laying out of grounds.

Mr. Clausen: There is an old saying, "Take the child by the hand, and you take the father and mother by the heart." That is what came to my mind when Mr. Drum read his paper. Mr. Underwood spoke about our our schools being at fault. I think he has got to go a little further back than our schools; parents are the first teachers. To illustrate this point I just want to tell a story about a father who was very anxious to have his boy go to Sunday School. He talked with him about it, but it did not seem to do very much good, for the boy did not seem to be interested in Sunday School and, for that matter, that is the case with a great many children today. The father tried to lick

Digitized by Google

him into going, but that did not help. He probably got him to go away from home, but he did not go to Sunday School, and, like so many other boys and girls, he went somewhere else. Finally the father made up his mind to go to the minister and ask him if he would not help him in the matter. He told the minister how hard he had tried to get his boy to go to Sunday School, but could not do it. The minister said, "There is one thing that perhaps you have not tried." The father said, "What is that?" The minister said, "Have you ever tried going to Sunday School with your boy?" The father had to admit that he had never tried that. Finally he started to go himself, and the boy went with him, and after that the father stayed in Sunday School, and he had no trouble in getting the boy to go there. We have got to go ahead first and show our children the way, and there is not much trouble but what they will follow. Let us try to commence to teach them while they are young and before we send them to school. If we do our part to help the teachers along, we will get some of them to be horticulturists, anyway.

Mr. Hawkins: We had in our city a garden club, and the children were given prizes for growing vegetables. The school children all took part, and there was great interest. I heard of no gardens being destroyed that summer, but each one seemed to take an interest in producing the best garden he possibly could. I think these things are very encouraging, and I think steps ought to be taken in every public school to do something along that line.

Mr. Drum: In my experience I have found that both teachers and pupils in the rural schools were very greatly interested, and wherever I have spoken in schools I have been most cordially received, and everything I had to say was very attentively listened to. This all takes very well in the rural schools and in the grade schools, but when we approach high school teachers I presume that is another matter. When I approached the superintendent of the high school and spoke to him regarding having a school of horticulture for a few weeks in our town, he said, "We have already got too many clubs, we are 'clubbed' to death." I tried to explain to him the advantages and to tell him that this was different from anything else. He said, "There are lots of university professors that come down here and tell us a whole lot of things, and they make the money out of it, and we don't get anything."

Mr. Kellogg (Wis.): I found that a good way to interest children in town is to give them strawberry plants. I offer them strawberry plants, from half a dozen to a dozen, and I set a day when they shall come and get them. The first day I made that offer I had nearly a hundred children come to the strawberry patch, and when they came to get them I told them how to take care of their strawberry beds.

Mr. Sahler: We hear a great deal about the condition of things being the fault of the teacher, but I do not think that we should blame the teachers so much since they are hired by the school board, and their duties are fixed by the board. They may be able to teach horticulture and would be glad to do so, but I think in most instances you would find that the school board was at the bottom of it and would not allow

Digitized by Google

them to do so. I believe it would be the proper thing to do to get an act passed by the legislature requiring that two weeks in every school year should be given up in our public schools to the teaching of horticulture, and this should be made general throughout the state in all schools. The teacher would probably like to teach this subject, but she does not do so because she is not permitted to do so. It seems to me it is time this question is settled by the enactment of a law.

Tomato Culture.

ERNEST PALM, ROCHESTER.

I generally use the Stone tomato for late and the Earliana for early, although any other good variety might do as well under favorable conditions.

I sow my seed in the hotbed about April 1st, using a good leaf mould, with a mixture of sand for a surface soil. I expose my plants to the sun and air as much as possible. As soon as they are out of the ground I do this to harden them, which prevents checking growth when transplanted. I sow them quite thin in the hotbed in order to take up enough mould with the plant to give it rapid growth when transplanted.

By watering only at night, keeping clear of weeds and keeping the glass off the top as much as possible, my plants do not exceed a growth of more than from seven to twelve inches by the middle of May, or transplanting time.

For my field I choose, if possible, a sandy soil, being careful to use very little fertilizer, as it encourages vine growth. I transplant a little deeper when they are set in the bed and prefer using a trowel in making holes, pressing the soil gently around the roots of the plant and watering immediately after transplanting.

I cultivate and hoe as often as possible, either on cloudy days or in the evening and never water my plants when the sun shines. I pinch off all side shoots and tie to a single stake for early fruit.

I have found the cutworm the worst enemy to the plant, and when they were extraordinarily numerous I tie a piece of newspaper around the stems when transplanting and sprinkle sulphur around the roots. Several of my neighbors tried paper alone and lost their plants, so I have come to the conclusion that it was the sulphur that saved mine, as my loss was only about one per cent.

By following this method of cultivation I have invariably succeeded in having the earliest ripe tomatoes in the vicinity and hope I may be the means of bringing more into the market at an earlier date than ever.

Digitized by Google

First Annual Report of State Forester of Minnesota.

BY PROF. E. G. CHEYNEY, DIRECTOR OF THE FOREST SCHOOL, UNIVERSITY OF MINNESOTA.

(Copy of the report referred to can be had by addressing the State Forester, Wm. T. Cox, Capitol, St. Paul.)

We always look forward with interest to the first report of any new undertaking to see what it promises for the future. This is especially true in the case of the establishment of a new department in the state service. Will it simply assume the titles given it by law and proceed to spend the appropriation allotted to it in the easiest and least disturbing way? Will it become a part of the political machine, a roosting place for lame ducks, using its appointive power to secure the votes of otherwise useless employees? Or will it really be an efficient organization, grasping the problems presented to it with a broad comprehension of its possibilities, striving for the welfare of the state and seeking to get value received for every penny expended?

That is the most important question, and it is answered in the first annual report of the state forester of Minnesota in no uncertain tone. The whole report rings true to the note of efficiency and service. All the men in the new service are technically trained men or experienced woodsmen, holding their positions through efficiency.

A mere glance at the nature of the contents of the report shows the broad conception which the forester has of his duties: fire prevention and fire fighting in all its phases, including the education of its citizens, the disposal of slash, the protection of frontier towns, the building of watch towers, the improvement of trails and portages, the construction of telephone lines, the surveying and mapping of tracts of absolute forest land, a study of the extent and distribution of the state's forests, the forest's share in the wealth and welfare of the state, the education of the people at large in the value and benefits of permanent forests.

That outlines a far-reaching and comprehensive program. Whether it can be carried to completion in all its branches in the future depends largely on the people of the state, but it shows that the forester has a true conception of his large responsibilities.

Naturally the bulk of the report deals with the fire problem, the first that the forester must meet in any field. The organization consists of the state forester with the assistant state forester, working through a force of fifteen permanent district rangers, who in turn have under them a force of temporary patrolmen. The first

Digitized by Google

object is fire prevention; the second to extinguish existing fires as quickly as possible. Every effort is directed first toward prevention.

To those familiar with the former attitude of all those interested in forest fires in Minnesota, the most remarkable feature of the whole report is the truly wonderful degree to which all these diverse interests have been induced to cooperate with the new forest service in the protection of the forests.

Cleaning right of way for railroad through dense timber. Slash burned clean under direction of ranger. Pulp wood will be hauled off.

The United States Forest Service under the "Weeks law" gave $10,000 for the employment of patrolmen to work under the district rangers on the watersheds of the navigable streams.

The railroads kept reserves to act as patrolmen along their rights of way at the call of the rangers in the danger season, and extended many courtesies to aid the new service.

Some of the timber owners hired patrolmen of their own to work under the rangers.

A large number of organized towns taxed themselves to add their patrolmen of the state force.

The number of patrolmen, and hence the working efficiency of the service, was more than doubled through cooperation.

One of the most interesting features brought out, especially interesting because it is a new idea, is the protection of the towns

Digitized by Google

in the forest areas by the construction of firebreaks around them. Such breaks were built only at the instigation and with the cooperation of the state forest service. Such a break would have saved any one of the numerous towns which have been wiped out by forest fires in the past years. The method and cost of construction makes interesting reading.

But even more interesting is the description of the great firebreak in the great burnt-over district devastated by the tremendous fires which destroyed the towns of Baudette and Spooner two years ago. This work, made possible by a contribution from the Red Cross fund for the aid of the fire sufferers in that district, is the most comprehensive system of firebreaks in the country that has ever been constructed for the protection of such an extensive area. Would not such systems of breaks pay in every forested area?

Where trails give out, forest officers must build rafts to cross the nameless lakes—Northern Cook county.

Quite as interesting, and probably the most valuable, data in this report is the detailed description and accurate cost data on the extinction of an extensive bog fire in southeast Polk county, covering an area of 236 acres, by means of a power ditcher and constant control, at a cost of $1,800. It shows how serious these fires can really be. The moral drawn is that they are very cheaply handled when small and very expensive when allowed to grow. They are usually totally neglected.

Digitized by Google

Although this work of fire prevention and fire fighting naturally occupies most of the state forester's time at present and a large proportion of his report, he makes it distinctly understood that he considers it only as the preliminary step which will make his proper work, the scientific management of the state's forests, possible.

Among the interesting facts contained in the report is the statement of Minnesota's forest resources. In spite of the ravages of legitimate lumbering and inexcusable fire loss, she still has the greatest forests of any state east of the Rocky Mountains. They are spread over 28,000,000 acres and contain approximately 75,000,000,000 feet of merchantable timber, with a value to the people of the state equivalent to $975,000,000. Quite a considerable portion of this is made up of hard woods located in the southern portion of the state.

The report as a whole is a very good record of the year's work of the state forest service—a virile record of the achievement of things worth while—and contains most valuable information. Its honest striving for the welfare of the state and its pointed calls to the needs of the future should enlist the sympathy and support of every true patriot. It is a true, manly appeal which every one should heed. If the forester can attain the goal he sets up for himself in this first report, the conservation of Minnesota's forest wealth is assured.

It is to be regretted that more space in the report cannot be given to the "state forests". That, however, is not he fault of the report, but due to the lack of "forests". Out of more than two million acres of forested land actually owned by the state, only three pitifully small tracts are under the control of the forester. Millions of acres are wasting away in idleness, either in the possession of the state herself or of private parties. Moreover, large areas of non-agricultural lands are constantly reverting to the state for non-payment of taxes, to be bought up by the speculator, who alone profits in the subsequent sales and re-sales to unsuspecting purchasers. These lands should be producing valuable timber crops. It is to be hoped that the great state of Minnesota will soon turn over some of them to the state forester, so that they can be cared for in a businesslike manner, thus adding, with their productiveness, to the wealth of the state.

Digitized by Google

Awards in Horticultural Dept. Minn. State Fair, 1912.

Number of Exhibitors. 53 Number of Entries, 965

CLASS 87. APPLES.

(Open to all.)

Judge: LeRoy Cady, St. Anthony Park.

Collection of 15 named varieties: $20.00 $15.00 $10.00 $5.00
First, P. H. Perry, Excelsior; second, Mrs. S. R. Spates, Wayzata; third, D. C. Webster, La Crescent; fourth, J. A. Howard, Hammond.

Collection of ten named varieties: $15.00 $10.00 $ 8.00 $5.00
First, D. C. Webster; second, P. H. Perry; third, Mrs. S. R. Spates; fourth, Geo. W. Strand, Taylors Falls.

CLASS 88. APPLES.

(Commercial Exhibits.)

Judge: A. R. Kohler, St. Paul, Minn.

Best single box, any variety: $15.00 $10.00 $ 7.00 $5.00 $3.00
First, D. C. Webster; second, P. H. Perry; third, F. I. Harris; fourth, W. M. McDonald, Excelsior; fifth, H. B. Avery, Excelsior.

Best three boxes, any variety: $20.00 $15.00
First, D. C. Webster; second, W. M. McDonald.

Best five boxes, any variety: $25.00 $20.00 $15.00
First, D C. Webster; second, P. H. Perry; third, Excelsior Fruit Growers Ass'n., Excelsior.

Best ten boxes, any variety: $50.00 $40.00 $30.00
First, D. C. Webster; second, F. I. Harris; third, J. A. Howard, Hammond.

Best ten (two layer) boxes: $20.00 $15.00 $10.00 $5.00
First, P. H. Perry; second, Excelsior Fruit Growers' Ass'n.; third, D. C. Webster; fourth, A. B. Lyman, Excelsior.

CLASS 89. APPLES.

(For professionals.)

Judge: LeRoy Cady.

Collection of named varieties: $50.00 $30.00 $20.00
First, F. I. Harris; second, J. A. Howard; third, A. B. Lyman.

SINGLE PLATES: 1st, $1.00; 2nd, $.75; 3rd, $.50.

Antonovka:—First, A. B. Lyman; second, F. I. Harris.
Anis:—First, F. I. Harris; second, J. A. Howard.
Anisim:—First, A. B. Lyman; second, J. A. Howard; third, Thomas Redpath.
Brett:—First, F. I. Harris; second, A. B. Lyman; third, Thomas Redpath.
Borovinca:—First, Geo. W. Strand; second, Carl G. Steller; third, Thomas Redpath.
Christmas:—First, Geo. W. Strand; second, A. B. Lyman; third, J. A. Howard.
Evelyn:—First, A. B. Lyman.
Fameuse:—First, J. A. Howard.
Gideon:——First, A. B. Lyman; second, F. I. Harris; third, J. A. Howard.
Gilbert:—First, F. I. Harris; second, J. A. Howard.
Iowa Beauty:—First, J. A. Howard; second, F. I. Harris.
Jewell's Sweet:—First, Thomas Redpath.
Jewell's Winter:—First, Thomas Redpath; second, J. A. Howard; third, H. F. Busse, Merriam Park, St. Paul.
Lord's L:—First, F. I. Harris; second, Thomas Redpath; third, J. A. Howard.
Longfield:—First, A. B. Lyman; second, Carl G. Steller; third, Thomas Redpath.
Lowland Raspberry:—First, A. B. Lyman; second, H. F. Busse.
Milwaukee:—First, J. A. Howard; second, F. I. Harris.
Plumb's Cider:—First, A. B. Lyman.
Red Wine:—First, A. B. Lyman.
St. Lawrence:—Second, F. I. Harris; third, J. A. Howard.
Superb:—First, A. B. Lyman.
Utter:—First, A. B. Lyman; second, F. I. Harris; third, Thomas Redpath.
University:—First, F. I. Harris; second, A. B. Lyman; third, J. A. Howard.
Walbridge:—Second, J. A. Howard; third, F. I. Harris.
Yahnke:—First, Thomas Redpath; second, F. I. Harris.
Yellow Sweet:—Second, A. B. Lyman.
Yellow Transparent:—First, Carl G. Steller; second, J. A. Howard.

Digitized by Google

SINGLE PLATES: 1st, $3.00; 2nd, $2.00; 3rd, $1.50; 4th, $1.00; 5th, $.50.

Charlamoff:—First, Carl G. Steller; second, A. B. Lyman; third, Geo. W. Strand; fourth, F. I. Harris.
Duchess:—First, Carl G. Steller; second, Geo. W. Strand; third, J. A. Howard; fourth, F. I. Harris; fifth, Thomas Redpath.
Hibernal:—First, Carl G. Steller; second, Thomas Redpath; third, A. B. Lyman; fourth, H. F. Busse.
Malinda:—First, A. B. Lyman; second, J. A. Howard; third, F. I. Harris.
McMahon:—First, J. A. Howard; second, F. I. Harris; third, Thomas Redpath; fourth, A. B. Lyman.
Northwestern Greening:—First, F. I. Harris; second, J. A. Howard; third, Carl G. Steller; fourth, A. B. Lyman; fifth, Thomas Redpath.
Okabena:—First, F. I. Harris; second, J. A. Howard; third, H. F. Busse.
Patten's Greening:—First, A. B. Lyman; second, Carl G. Steller; third, J. A. Howard; fourth, Geo. W. Strand; fifth, F. I. Harris.
Peerless:—First, F. I. Harris; second, A. B. Lyman; third, H. F. Busse; fourth, Thomas Redpath; fifth, Geo. W. Strand.
Wealthy:—First, F. I. Harris; second, Thomas Redpath; third, Carl G. Steller; fourth, Geo. W. Strand; fifth, J. A. Howard.
Wolf River:—First, Thomas Redpath; second, Ernest Ziemer, St. Bonifacius; third, F. I. Harris; fourth, Carl G. Steller; fifth, J. A. Howard.

CLASS 90. APPLES.

(For Amateurs.)

Judge: A. R. Kohler, St. Paul.

Collection of named varieties: $40.00 $25.00 $15.00
First, P. H. Perry; second, D. C. Webster; third, W. J. Tingley, Forest Lake.

SINGLE PLATES: 1st, $1.00; 2nd, $.75; 3rd, $.50.

Anis:—First, F. J. Butterfield, Long Lake; second, H. L. Popenoe, Alexandria.
Anisim:—First, H. B. Avery, Excelsior; second, P. H. Perry; third, W. M. McDonald.
Antonovka:—First, P. H. Perry; second, D. C. Webster; third, F. J. Butterfield.
Brett:—First, D. C. Webster; second, P. H. Perry; third, W. J. Tingley.
Borovinca:—First, W. M. McDonald; second, P. H. Perry; third, F. J. Butterfield.
Christmas:—First, P. H. Perry.
Evelyn:—First, P. H. Perry.
Fameuse:—First, P. H. Perry.
Gideon:—First, Ronald Olson, Mankato; second, D. C. Webster; third, C. M. Jenson, Albert Lea.
Gilbert:—First, F. F. Farrar, White Bear; second, W. J. Tingley; third, D. C. Webster.
Iowa Beauty:—First, Mrs. S. R. Spates, Wayzata; second, P. H. Perry; third, Ronald Olson.
Jewell's Winter:—First, Ronald Olson; second, Mrs. S. R. Spates.
Lord's L:—First, D. C. Webster; second, W. J. Tingley.
Longfield:—First, H. B. Avery; second, W. M. McDonald; third, D. C. Webster.
Red Wine:—First, Mrs. S. E. Barker, Excelsior.
Superb:—First, W. J. Tingley.
Tetofsky:—First, P. H. Perry.
Utter:—First, D. C. Webster.
University:—First, Mrs. R. B. Hazard, Excelsior, Minn; second, P. H. Perry, Excelsior, Minn.; third, Paul Burtzlaff, Stillwater.
Yahnke:—First, P. H. Perry; second, W. J. Tingley, Forest Lake, Minn.
Yellow Sweet:—Second, W. J. Tingley.
Yellow Transparent:—First, P. H. Perry; second, C. M. Jenson, Albert Lea, Minn.; third, Mrs. Mary A. Knowles, Excelsior, Minn.

SINGLE PLATES: 1st, $3.00; 2nd, $2.00; 3rd, $1.50; 4th, $1.00; 5th, $.50.

Charlamoff:—First, Ronald Olson; second, W. M. McDonald; third, Mrs. S. R. Skates; fourth, W. J. Tingley; fifth, P. H. Perry.
Duchess:—First, W. M. McDonald; second, D. C. Webster; third, P. H. Perry; fourth, F. J. Butterfield; fifth, Frank Moris, Lake Elmo.
Hibernal:—First, F. F. Farrar; second, Chas. F. Nelson, Braham; third, Ronald Olson; fourth, G. A. Mason, Maple Plain; fifth, Mrs. S. E. Barker.
Malinda:—First, H. B. Avery; second, W. M. McDonald; third, G. A. Mason; fourth, Ronald Olson; fifth, C. M. Jensen.
McMahon:—First, Mrs. R. B. Hazard; second, D. C. Webster; third, Ronald Olson; fourth, Mrs. S. R. Spates; fifth, Frank Moris.
Northwestern Greening:—First, H. B. Avery; second, D. C. Webster; third, W. M. McDonald; fourth, Mrs. S. E. Barker; fifth, Fred Maltby, Rich Valley.
Okabena:—First, W. M. McDonald; second, P. H. Perry; third, H. B. Avery; fourth, Fred Maltby; fifth, Mrs. S. R. Spates.
Patten's Greening:—First, Mrs. S. R. Spates; second, W. M. McDonald; third, D. C. Webster; fourth, P. H. Perry; fifth, Mrs. R. B. Hazard.
Peerless:—First, P. H. Perry; second, W. M. McDonald; third, Mrs. S. R. Spates; fourth, Frank Moris; fifth, D. C. Webster.
Wealthy:—First, D. C. Webster; second, P. H. Perry; third, W. M. McDonald; fourth, Mrs. S. R. Spates; fifth, H. B. Avery.
Wolf River:—First, W. M. McDonald; second, P. H. Perry; third, Ronald Olson.

Digitized by Google

CLASS 91. CRABS AND HYBRIDS.

(Open to All.)

Judge: LeRoy Cady, St. Anthony Park.

Collection of ten named varieties: $ 8.00 $ 6.00 $ 4.00 $2.00

First, P. H. Perry; second, Carl G. Steller; third, J. A. Howard; fourth, Geo. W. Strand.

SINGLE PLATES: 1st, $1.50; 2nd, $1.00; 3rd, $.50.

Dartt:—First, D. C. Webster; second, H. Vollenweider, La Crescent; third, F. L. Harris.
Early Strawberry:—First, P. H. Perry; second, Frank Moris; third, W. J. Tingley.
Faribault:—First, Mrs. R. B. Hazard; second, Mrs. S. R. Spates.
Florence:—First, P. H. Perry; second, W. M. McDonald; third, Paul Burtzlaff.
Gideon:—First, Geo. W. Strand; second, P. H. Perry.
General Grant:—First, Chas. F. Nelson; second, J. A. Howard.
Hyslop:—First, Geo. W. Strand; second, W. J. Tingley; third, P. H. Perry.
Lyman's Prolific:—First, F. F. Farrar; second, Carl G. Steller; third, P. H. Perry.
Minnesota:—First, J. A. Howard; second, Mrs. S. E. Barker; third, Chas. F. Nelson.
Montreal Beauty:—First, J. A. Howard.
Orange:—First, C. M. Jenson; second, J. A. Howard; third, Mrs. S. E. Barker.
Pickett's:—First, J. A. Howard.
Pride of Minneapolis:—First, Mrs. S. R. Spates; second, F. J. Butterfield; third, Thomas Redpath.
Sweet Russet:—First, P. H. Perry; second, Geo. W. Strand; third, J. A. Howard.
Transcendent:—First, Ronald Olson; second, F. I. Harris; third, Alfred J. Davis, Minneapolis.
Virginia:—First, H. Vollenweider; second, Mrs. S. E. Barker; third, F. I. Harris.
Whitney:—First, P. H. Perry; second, Carl G. Steller; third, Mrs. S. R. Spates.
Seedling Winter Crab:—First, G. A. Mason; second, Hamlin V. Poore, Bird Island; third, Thomas Redpath, Wayzata, Minn.

CLASS 92. SEEDLING APPLES.

(Open to All.)

Judges: LeRoy Cady, St. Anthony Park; Chas. Haralson, Excelsior; Wyman Elliot, Minneapolis.

Collection: $50.00 $30.00 $20.00
First, T. E. Perkins; second, A. B. Lyman; third, J. A. Howard.
Summer Variety: $ 6.00 $ 4.00 $ 2.00 $1.00
First, T. E. Perkins; second, A. B. Lyman; third, H. H. Pond, Minneapolis; fourth, Thomas Redpath.
Fall Variety, not sweet: $ 6.00 $ 4.00 $ 2.00
First, Thomas Redpath; second, J. A. Howard; third, A. B. Lyman.
Fall Variety, not sweet: $ 6.00 $ 4.00 $ 2.00 $1.00
First, Thomas Redpath; second, T. E. Perkins; third, A. B. Lyman; fourth, T. E. Perkins.
Winter Variety, not sweet: $10.00 $ 8.00 $ 4.00 $2.00
First, J. A. Howard; second, Mary A. Knowles; third, J. A. Howard; fourth, Thomas Redpath.
Winter Variety, not sweet: $10.00 $ 8.00 $ 4.00 $2.00
First, A. B. Lyman; second, T. E. Perkins; third, Thomas Redpath; fourth, G. A. Mason.
Sweet Variety: $ 6.00 $ 4.00 $ 3.00
First, A. B. Lyman; second, A. B. Lyman; third, J. A. Howard.

CLASS 93. PLUMS.

(Open to All.)

Judges: Wyman Elliot, Minneapolis; Chas. Haralson, Excelsior.

Best ten named varieties: $10.00 $ 6.00 $ 4.00
First, J. A. Howard; second, Geo. W. Strand; third, Dewain Cook, Jeffers.
Collection: $15.00 $ 8.00 $ 7.00
First, J. A. Howard; second, Geo. W. Strand; third, Dewain Cook.

SINGLE PLATES:..1st, $1.00; 2nd, $.75; 3rd, $.50.

Bender:—First, Geo. W. Strand; second, J. A. Howard; third, Marion DeWitt, Hammond.
Brittlewood:—First, Geo. W. Strand; second, J. A. Howard; third, Marion DeWitt.
Black Hawk:—First, Dewain Cook; second, J. A. Howard; third, Marion DeWitt.
Cheney:—First, W. J. Tingley; second, Alfred J. Davis; third, Geo. W. Strand.
DeSoto:—First, Ronald Olson; second, Geo. W. Strand; third, E. G. Enestvedt, Sacred Heart.
Emerald:—First, Dewain Cook; third, J. A. Howard.
Eureka:—First, J. A. Howard; second, Dewain Cook; third, Marion DeWitt.
Forest Garden:—First, Ernest Ziemer, St. Bonifacius; second, Mrs. S. R. Spates;

Digitized by Google

third, Chas. F. Nelson.
Hawkeye:—First, Geo. W. Strand; second, J. A. Howard; third, Marion DeWitt.
New Ulm:—First, Geo. W. Strand; second, J. A. Howard; third, C. M. Jenson.
Ochesda:—First, Geo. W. Strand; second, J. A. Howard.
Rockford:—First, Geo. W. Strand; second, Marion DeWitt; third, J. A. Howard.
Shipper's Pride:—First, J. A. Howard.
Stoddard:—First, Geo. W. Strand; second, J. A. Howard; third, Marion DeWitt.
Surprise:—First, Donald Winston, Tonka Bay; second, Geo. W. Strand; third, J. A. Howard.
Rolingstone:—First, Mrs. S. R. Spates; second, Geo. W. Strand; third, J. A. Howard.
Terry:—First, Geo. W. Strand; second, J. A. Howard; third, Marion DeWitt.
Weaver:—First, Geo. W. Strand; second, H. F. Busse; third, Mrs. S. R. Spates.
Wolf Clingstone:—First, Geo. W. Strand; second, Ronald Olson; third, J. A. Howard.
Wyant:—First, Geo. W. Strand; second, Hamlin V. Poore; third, W. J. Tingley.

CLASS 94. MISCELLANEOUS.

(Open to All.)

Judges: Wyman Elliot, Minneapolis; Chas. Haralson, Excelsior.

Compass Cherry: $ 1.00 $ .75 $ .50
First, C. M. Jenson; second, Ernest Ziemer; third, Geo. W. Strand.

Seedling of Japan Hybrid Plums: $ 5.00 $ 3.00
First, J. A. Howard; second, Mrs. A. Brackett, Excelsior.

Seedling Plums: $ 5.00 $ 4.00 $ 3.00
First, W. J. Tingley; second, Alice Kerredge, Minneapolis; third, H. F. Busse.

CLASS 95. GRAPES.

(Open to All.)

Judges: Wyman Elliot, Minneapolis; A. W. Latham, Minneapolis.

Collection: $20.00 $15.00 $10.00 $8.00
First, Fred C. Averill; second, P. H. Perry; third, Mrs. S. E. Barker; fourth, Geo. W. Strand.

SINGLE PLATES: 1st, $1.00; 2nd, $.75; 3rd, $.50.

Agawam:—First, P. H. Perry; second, Fred C. Averill; third, Geo. W. Strand.
Aminia:—First, Fred C. Averill.
Brighton:—First, Fred C. Averill; second, Geo. W. Strand; third, P. H. Perry.
Cottage:—First, Fred C. Averill; second, Geo. W. Strand.
Campbell's Early:—First, Fred C. Averill; second, Geo. W. Strand.
Duchess:—First, Fred C. Averill; second, Mrs. S. E. Barker.
Early Victor:—First, Mrs. S. E. Barker; second, Fred C. Averill; third, P. H. Perry.
Eldorado:—First, Mrs. S. E. Barker; second, Fred C. Averill.
Empire State:—First, P. H. Perry; second, Mrs. S. E. Barker; third, Fred C. Averill.
Green Mountain:—First, P. H. Perry.
Herbert:—First, Fred C. Averill.
Iona:—First, Fred C. Averill.
Janesville:—First, P. H. Perry; second, Fred C. Averill; third, Geo. W. Strand.
Lindley:—First, P. H. Perry.
Lady:—First, Mrs. S. E. Barker; second, Fred C. Averill; third, P. H. Perry.
Martha:—First, P. H. Perry; second, Fred C. Averill; third, Geo. W. Strand.
Massasoit:—First, P. H. Perry.
Moore's Diamond:—First, Fred C. Averill; second, P. H. Perry; third, Geo. W. Strand.
Niagara:—First, Fred C. Averill; second, Mrs. S. E. Barker; third, Geo. W. Strand.
Pocklington:—First, Fred C. Averill; second, Mrs. S. E. Barker; third, Geo. W. Strand.
Pokeepsie Red:—First, Mrs. S. E. Barker; second, P. H. Perry; third, Fred C. Averill.
Telegraph:—First, P. H. Perry; second, Mrs. S. E. Barker; third, Fred C. Averill.
Wilder:—First, P. H. Perry.
Woodruff Red:—First, Fred C. Averill; second, Mrs. S. E. Barker; third, P. H. Perry.
Wordon:—First, H. Vollenweider; second, Fred C. Averill; third, Mrs. S. E. Barker.
Wyoming Red:—First, Fred C. Averill; second, Geo. W. Strand; third, P. H. Perry.

SINGLE PLATES: 1st, $1.50; 2nd, $1.25; 3rd, $1.00; 4th, $.75.

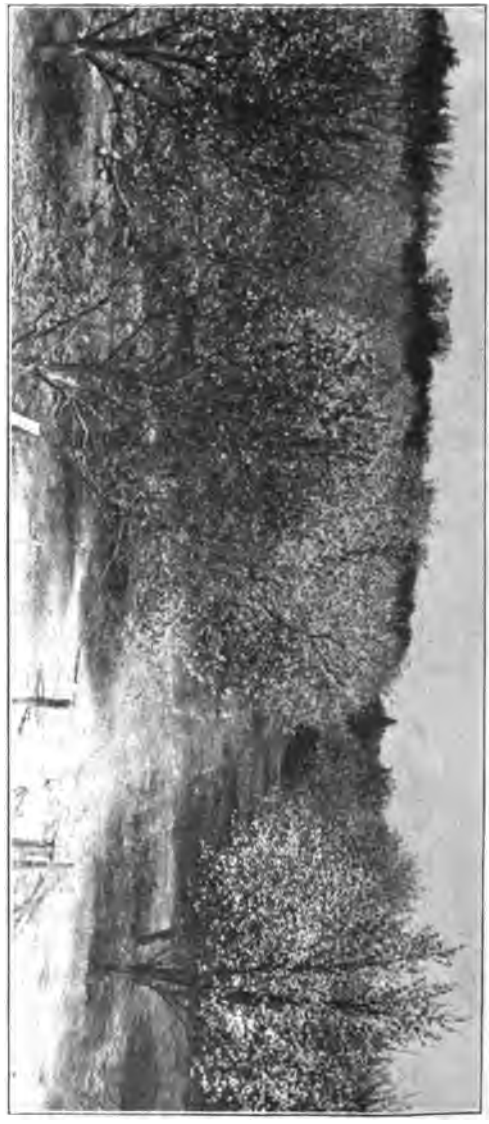
Beta:—First, Geo. W. Strand; second, Alfred J. Davis; third, G. O. Bergan, Sacred Heart.
Concord:—First, Fred C. Averill; second, Mrs. S. E. Barker; third, P. H. Perry; fourth, Geo. W. Strand.
Delaware:—First, P. H. Perry; second, Fred C. Averill; third, Geo. W. Strand.
Moore's Early:—First, Fred C. Averill; second, Mrs. H. B. Tillotson; Eureka; third, Mrs. S. E. Barker.
Single Variety Seedling:—First, Frank Stifter, Cokato.
Single Variety Seedling:—First, Frank Stifter, Cokato, $3.00.

Digitized by Google

How to Develop a Top-Working Orchard.

F. W. KIMBALL, WALTHAM, (SO. MINN. HORT. SOCIETY).

The underpinning is what makes for success in top-working, and unless that is secure you have builded on the sands. Were I a young man, I would select seeds from the hardiest of our Minnesota grown apples and from them raise the seedling root on which I would graft the Hibernal cion, and I would thus, I think, have a good strong underpinning to start on. When these Hibernal trees were three years old I would set them in the orchard row and later top-work. When once set in orchard row they should be developed by continuous cultivation for at least five or six years, and longer would be better.



East side view of F. W. Kimball's top-worked orchard at Austin—from photo taken at an elevation.

As we have the sunscald to contend with, we should use every effort to protect our trees from its ravages. At Mr. Gaylord's suggestion, I tried on a few trees the experiment of trimming off all limbs on the northeast side and kept that side bare for a number of years. At the time it made them look very lop-sided, but as soon as given a chance they balanced themselves up and made good looking trees. The tendency

Digitized by Google

of this trimming was to cause them to make a heavy growth on the south and west sides and so to a great extent to protect themselves.

I believe it desirable to develop a low top, as a low top tends to protect the stem or trunk, and it does not get the effect of the winds as does the high topped tree, and at time of gathering the crop is more easily picked.

Trees are not injured by sun scald till they have attained considerable size, so that they concentrate and hold the rays of the sun. So if one wishes he can plant a root of asparagus or a Crandall tree currant on the southwest side of the tree at the time of setting, and by the time the tree gets growth enough so it might injure the asparagus or currant would afford great protection.

Now while I prefer starting at the very root, I would advise any one that has ready grown hardy trees, such as Hibernal, Virginia crab, Duchess, and probably many others, and is desirous of raising some choice winter apples, that they start in and top-work, and they will be surprised at how soon they can have a cellar filled with the choicest of winter apples. At the present time there seems a large field for selection of varieties, yet I feel that there are but a few varieties that have had long enough trial in this latitude to warrant trying them on a large scale, but if we have no more trying seasons than we have had in the last twenty years the number that would be safe is large, and the range from early winter to late spring and of quality that would or should suit a king.

Horticultural Notes of Last Season.

C. M. JENSON, ALBERT LEA, (SO. MINN. HORT. SOCIETY).

About the first horticultural work that I did last season was to spray. I had a few trees that were infested with the oyster-shell scale, so along in March I covered the trees with a lime-sulphur wash, using at the rate of fifteen pounds each of lime and sulphur to fifty gallons of water. It being my first attempt at making a lime-sulphur solution, I know that I did not get it quite right, but it gave good results as it was.

Later in the season I sprayed all of my bearing trees with what is known as the iron-sulphide solution. It is made by using a self-boiled lime-sulphur solution, of a strength of eight pounds each of lime and sulphur to every fifty gallons of water, and adding two

Digitized by Google

or three pounds of copperas that has been thoroughly dissolved in water. When the copperas is added to the lime-sulphur the mixture turns black. When the spray first dries on the trees it is a slate color, but in a few days it turns to a reddish brown. With the summer spray I used two pounds of arsenate of lead to every fifty gallons.

The copperas is used to make the spray adhere better than the ordinary lime-sulphur mixture. I have been told that neither fungous diseases nor insects were very bad last season, so I do not know how much credit to give the spraying, but I do know that what fruit I had was better than any I have raised in previous years. Those trees that were infested with the scale were given an extra heavy application of the summer spray, and I noticed that their foliage had a very healthy, dark green color all through the season. I think that it would pay the fruit growers to experiment with the different lime-sulphur solutions as they are claimed to be ahead of bordeaux mixture for all purposes.

For several seasons past I have been doing a little top-working. Three or four years ago I put in some new varieties of apples, of which one was the Delicious. As I wanted that variety to fruit as quickly as possible I gave it the best place, as I then thought, by grafting it in the very top of a large Hibernal. Nearly all the other varieties top-worked at the same time have fruited, but I am still waiting for those Minnesota grown Delicious. Next time when I want quick results I am going to use a good, strong branch at the center of the tree. Of the newer varieties of apples that fruited for me the past season, I shall mention only a few: Wilson's June, top-worked on Hibernal, bore heavily. The apples are of a beautiful dark red color and of good quality. Another variety, which I received as the Gravestein, turned out to be a very large yellow apple, of good quality and is said to be a fine keeper. Three small trees of the Black Annette, one top-worked on Hibernal and two root-grafted, bore heavy crops. For quick results, the Longfield as a fall apple and the Black Annette as a winter apple would be hard to beat.

Some of the plum trees bore a heavy crop. I had an extra early seedling plum, of medium size, that I thought was pretty good until I saw what they had at the state fair. After that I wasn't so sure. The Red June and Omaha plums, top-worked, fruited for the first time, and the Omaha especially grew to an extra large size.

Digitized by Google

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by Mrs. E. W. Gould, 2644 Humboldt Avenue So., Minneapolis

A Good Garden Rule.—Do all the work in the garden you possibly can in the fall, thus avoiding the spring rush.

Save all the autumn leaves. Make a compact heap of them. It will be worth many dollars to you next year.

Japanese lily bulbs do not reach this country until November. Therefore heap fresh manure over the place where you wish to plant them, and you can have unfrozen ground in which to plant them.

You can have the earliest sweet peas by preparing the ground for them now. Also try planting a part of them in November. They do not make any growth until spring but will be much earlier than those planted then, and some claim their flowers are much larger.

Field mice do $3,000,000 of damage each year. They not only eat almost every kind of root and bulb but also destroy fruit trees. Do not mulch your borders and beds until after the ground has frozen, and they have found winter quarters. It is a good plan to put some poisoned bait about the beds before covering in case any of them venture in.

All hardy shrubs *that do not bloom in the spring* can be pruned now, also vines and hardy roses.

As soon as the annuals and perennials have been killed by the frosts the garden can be given its last cleaning. Annuals should be pulled up, and perennials cut off about three inches above the ground. Then weed the entire garden and, last of all, burn all of the refuse, that no seeds of weeds are left for another year and no place is given insects to hide in during the winter. Be sure to burn any foliage that is diseased. Be on the lookout for any winter nests of garden pests and burn them.

If you have any unoccupied land to be used next spring plow or spade it now. The snow, rain and frost will mellow it and kill the insects.

Poppies and corn flowers can be planted in November for early blooming next year.

A mulch of manure can be given all trees and shrubs, the bulb beds, and perennials that *die down to the ground* in fall. This mulch to be given *after the ground is frozen.* Cover perennials that do not die down but carry their green hearts through the winter (such as canterbury bells and fox gloves) first with a little brush and then with leaves, cornstalks or straw. The covering must not be so heavy as to exclude the air, as these plants are more often killed by rotting than by the cold.

Digitized by Google

SECRETARY'S CORNER

LOOK FOR THE PROGRAM—to reach you about Nov. 12th. There will be plenty in it to interest every one of our members. Won't you come to the meeting and enjoy it with us?

PROF. JOHN CRAIG.—Recent information brings news of the death of John Craig, professor of horticulture at Cornell University, N. Y. At the time of his death Prof. Craig was also secretary of the American Pomological Society. No one connected with horticulture in this country is better known than Prof. Craig, and his death will be sincerely lamented by a host of friends. The writer had the pleasure of meeting him at an annual gathering of the Pomological Society some years ago and well appreciates his worth.

LIST OF NATIVE ORNAMENTAL PLANTS.—In the October number of our monthly a very complete list of ornamental plants, prepared by Miss Eloise Butler, curator of the wild botanical gardens maintained by the Minneapolis parks, was published, covering four pages of fine type. That we may have this list for distribution as called for, 100 copies have been struck off, and any one desiring a copy for his own use or to send away will be furnished one upon application to this office without expense. It is a very valuable list and has been prepared with a great deal of labor by one who is fully competent to do this work. We hope these lists will go into the hands of many who would appreciate them and make use of them in ornamental plantings about the home.

ANNUAL FLOWER SHOW.—The Minnesota State Florists will hold a flower show in the Auditorium, St. Paul, November 8, 9, 11 and 12. It is expected this will be one of the finest shows ever held in the West. The exhibits will consist mainly of chrysanthemums, which will be at their best at this season of the year. There will also be shown table decorations, potted plants, ferns, palms, orchids and carnations. Considerable money is being expended for decorative effects and lighting. The show will be well worth seeing. Premium lists may be obtained from S. O. Dysinger, St. Paul, Secretary of the Florists' Association. Mr. August Swanson will be the superintendent of the exhibit. . President Farquhar, of the Society of American Florists, will give a stereopticon lecture one evening, showing pictures of flower collections he has made in his European travels.

SULZER APPLE PACKING BILL.—In this number will be found a copy of the apple packing and grading bill which has just passed the National Congress and become a law. It will be interesting reading especially for the apple growers of the state, and indirectly for all apple buyers, as its use will certainly raise the grade of apples put upon the market and go a long ways towards assuring honest packing. As we understand it, the packing of apples and marking them as permitted under this bill is an optional affair, but as the passage of the bill is the result of persistent effort on the part of the larger fruit growers of the country, as we are informed, it is likely that it will be given a fair trial. It would certainly be refreshing to buy apples marketed in this way that would turn out uniformly the same kind of stock from top to bottom of the barrel.

Digitized by Google

Digitized by Google

SHAPELY EVERGREENS AT GEO. H. WHITING'S PLACE, YANKTON, S. D.

See opposite page.

Digitized by Google

☞After reading this magazine, will you please pass it along to some friend who will appreciate it and whom you may perhaps interest to become a member of the society—at least he should derive benefit from its reading. By distributing in this way the twelve magazines received during the year 1911, at the beginning of the next year, upon renewing your membership in the society you will be entitled to receive postpaid a cloth bound volume containing all the magazines for 1911 and much other interesting matter, with a full index of all its contents, entitled "Trees, Fruits and Flowers of Minnesota," a handsome book for your library and invaluable for reference.

THE MINNESOTA HORTICULTURIST

Vol. 40, DECEMBER, 1912. No. 12.

Evergreens on the Farm.

GEO. H. WHITING, NURSERYMAN, YANKTON, S. D.

There are not enough evergreens on the farms of the northwest, not as many as there should be, or would be, if the farmers really knew how well they might grow them or how valuable they are for the farm, the home and the stock yards. I still maintain, as I have often before, that one row will be worth about as much as ten rows of deciduous trees, and the cost is immensely less.

For beauty and ornament there really is nothing that adds to the cheerfulness and comfort of the prairie home during the winter months like a generous supply of evergreens around the buildings and yards. They give shelter when most needed and smile on us with their green freshness when there is no other green thing in sight.

It is really very hard to realize what a vast improvement a few evergreens are to a farm. "But," says the average farmer, "we cannot grow evergreens in this country; it's too dry." Now that is just where you are mistaken. If you are bordering on the dry belt, the evergreen is just the tree that you should plant, that is, provided you plant the right varieties, for they will really stand a dry soil and climate much better than the deciduous trees, as the nature of the foliage makes the evaporation, or transpiration, much less than it is with the deciduous trees; that is, the foliage does not give off so much moisture as that of the deciduous trees; therefore it takes less moisture to keep the trees alive and keep up the growth. So if you are in a dry location do not hesitate about planting the evergreen, but choose varieties that are native in the dry western sections. For high, dry ground, I would place them in the following order: ponderosa, or bull pine; red cedar, Colorado blue spruce, Black Hills spruce, dwarf mountain pine, Scotch pine, jack pine, American white spruce and the Austrian pine.

Digitized by Google

Any of the varieties named are well adapted to the soil and climate of the prairie sections of western Minnesota, Iowa and of the Dakotas.

The white pine, arbor vitae, Norway spruce, Douglas spruce, concolor spruce and other varieties of this class, do better east of the center of Minnesota and Iowa, though sometimes they do well west of this line where sheltered by other trees, but they do not endure the dry atmosphere so well as the first list named.

Now in regard to methods of handling, size, age, etc. A great many do not seem to know or understand that the evergreen as a rule is very slow of growth for the first three to five years. The tiny

Grove of mixed evergreens—on farm of Peter Siverts, at Canby.

seedlings usually grow from one to two inches in height the first year and need shade and protection in other ways. They should be transplanted at one to two years of age, and then again about two years later; in about two years thereafter, at about five or six years of age, they are of about the right size and age for the farmer to plant, when they will be found about as profitable as at any other size. They should be from two to three feet high, and at this size they will begin to make good annual growths, say from one to three feet per year.

It is a great mistake that a great many make in getting the tiny one or two year old seedlings (not transplanted), and some even

Digitized by Google

think that it will be cheaper to plant the seed. Either of these are almost sure to result in absolute failure.

Now I want to say that if you choose the proper varieties of the proper sizes, get trees that are alive when you receive them, and then do your work properly, you are sure to succeed. Remember, the trees should be transplanted ones that have a good supply of fibrous roots. They must not have the roots exposed to the sun or drying winds at any time enough to cause them to dry out, because the sap of the evergreen family is of a resinous nature and when once dried it hardens and forms into a wax or gum that cannot be softened by the application of water. IT IS PAST REDEMPTION. The sap cannot again be thinned without the application of dry heat to such a degree that it would be fatal to the life of the tree.

Remember that evergreens do not require a large amount of water at one time, but the roots must be kept constantly moist. There is nothing very hard about growing evergreens, and there is a whole lot of pleasure and profit in having them on the farm.

The proper time to raise plants from seeds of both perennials and biennials is as soon as the seeds of this season's flowers ripen. With an almost avaricious pleasure the keen gardener watches the ripening pods of some choice flowers in order that he may be ready to gather and dry them on paper in some safe place to sow at the first opportunity.

Some of the showiest flowers we have are thus easily grown and with so little trouble in the doing that it amounts to a pleasure to the doer. The most prominent varieties which occur to our mind are delphiniums, foxglove, canterbury bells, columbine, gaillardia, lychnis, gypsophila (baby's breath), arabis (rockcress), achillea, oriental poppy, phlox and hollyhocks. There are many more desirable kinds of the larger flowers, but the foregoing just makes a dozen, let us say, indispensable garden favorites.

DYNAMITE IN THE ORCHARD.—In the northwestern Pacific states dynamite is largely used for clearing land of tree stumps; but a more novel application is to drill holes from two to five feet into the soil and to explode dynamite cartridges in them, in order to break up and loosen the subsoil. This process may be carried out on land where orchards have already been planted, the quantity of dynamite used varying from twenty-five to one hundred pounds an acre.

Explosives are also being used very largely in the western states for digging ditches, especially in swampy clay ground. Slanting holes are punched at intervals of about two feet along the line of the proposed ditch; the middle hole is loaded with two or thre cartridges, the explosion of which serves to detonate the charges in the other holes, with the result that a mile or more of ditch may be blasted simultaneously.

Digitized by Google

A Plea for the Farmer's Garden.

P. M. PETERSON, SCHOOL OF AGRICULTURE, ST. PAUL.

Why is it that less than 25 per cent of the Minnesota farmers have gardens from which they can get a good variety of vegetables for the table? Some farmers answer the question by asking another. "What's the use? We have plenty of meat and potatoes and bread and butter. Why go to all this trouble when more important things are constantly demanding our attention?" Others say, "It is cheaper when we want any fruit or vegetable to go to town and buy. It is gathered and ready to use. All we have to do is to put it on the table." A third class of farmers admit that a good kitchen garden is a mighty nice thing to have but beg off with the excuse that they don't know how to raise garden truck. Inasmuch as there is plenty of good printed material on this last phase of the subject at the disposal of each and every farmer I shall not concern myself about it but shall confine my attention to the first two phases, the need of variety and the comparative cost of vegetable products.

The modern farmer does not hesitate to spend good, hard-earned money for large silos and expensive machinery, in order that his cows may have good palatable food all winter. He also changes the green food from time to time or mixes several kinds together. Does his personal love for his cows and his fond desire to see them smile with content and satisfaction prompt him to do this? That may be true of James J. Hill, who has plenty with which to satisfy his personal whims and fancies, but the ordinary farmer knows that this method of feeding lifts him out of the mire of debt and leaves him high and dry, and on the right side of the ledger. Succulent feed and variety do not give such great results because of their food content alone, but because they aid in digestion and enable the cow to extract a larger per cent of food material out of the other feeds.

This economical ration keeps the animal in a more healthy condition and increases her working capacity. If this holds true in one case, why should it not hold true in another? Is it not just as important that you keep yourself in a perfect state of health? In order to accomplish this you must turn your attention to the garden, with its palatable vegetables and delicious fruits. Do you and your family go to your noon-day meal with a joyful anticipation, or is eating another of the daily tasks that must be performed to enable you to keep above the sod? Picture a well prepared table, with tempting soup, greens, vegetable salad and berries, and compare it

Digitized by Google

with the ordinary meal. Why not have the food that you like and which is at the same time better for you? Undoubtedly you have these things occasionally, but they should be a part of your daily diet. It puts both you and the boys in a better frame of mind to go out and do a good day's work. How about that boy of yours? Are you having the same trouble that your neighbor is having, that of keeping him on the farm and away from the city? I know of no better way to solve that question than to feed him well. When he goes to town with a load of wheat and gets his dinner at a lunch counter, he may get a mighty poor meal, but it appeals to him, and he eats it with a relish, because it is something different from his daily diet. He goes home with the wrong impression, that the city is the place for him, where luxury is in great abundance. Let us make living on the farm seem worth while by furnishing the table with the good things that are near at hand.

P. M. Peterson, St. Anthony Park, Gideon Memorial prize winner.

In considering the advisability of buying berries and vegetables instead of producing them yourselves, you should take into account three things: First, will you actually buy these things as you need them? Second, what is the condition of the product when you buy it? And, lastly, what is the actual cost of production? It is well and good when spring opens up and the seeding is in full swing to pigeon-hole the garden question with the promise that this summer you will go to town regularly and purchase a good supply of these more desirable things for the table. That is an easy way to dispose of the matter, and your wife may be temporarily satisfied unless she has heard that same excuse for the last ten years. Later on in the spring, when asparagus, greens, onions, radishes and lettuce should be a part of your daily diet, you may be too busy to let so minor a question command your attention. When the strawberry season comes you are

Digitized by Google

still busy, and the shortcake you like so well is a minus quantity. Thus the summer passes, and you are not only deprived of these luxuries in summer but the winter supply of canned goods is also lacking.

If perchance you are a man of your word, you go to town and lay in a daily or bi-weekly supply, but a supply of what? As a general rule, the present day gardener is careful about bringing in fresh products, but after the grocer has had them a day or two, lying in the sun, with plenty of flies and dust around, they have lost much of their crispness and most of their flavor. The berries may have been dumped out by each customer who is suspicious of the bottom layer, and you get them in a very unsanitary condition. Why be satisfied with these conditions when you can produce them easily and cheaply in your own garden?

A one-half acre plot will supply the ordinary family with a large variety of fresh, crisp vegetables and a few of the more common berries, at a cost far below the market price. According to government statistics in 1900, the average value of one acre of garden stuff was $147.17, while that of wheat was only $11.65. This applied to market gardens, where large amounts went to waste because of their perishable nature and the variation in market demands. The state of Illinois carried out some interesting experiments on a half acre plot. As far as possible they conducted it just as you would do in supplying your own table. An accurate account was kept of all the labor except the harvesting and the seed. The products themselves were valued at the average market price. In 1904, at the slight expense of $27.73, a crop worth $136.81 was produced. The average yearly income for the five years was a net profit of $74.85, which, at that rate, would be $149.70 per acre. These figures are worthy of more than passing notice, as they represent, as far as it is possible for an experiment station to do so, the actual conditions on the farm.

A few statistics from Mr. F. H. Gibbs will give you some idea of what can be done under market gardening conditions. This year (1911) his onions averaged $395.00 per acre, at a cost of $60.00, which does not include the hauling of manure. From a beet patch, slightly less than an acre in size, he realized approximately $425.00. The cost of production was less than that of onions. From a large field of Holland cabbage Mr. Gibbs obtained a yield of twenty-two tons per acre, which was sold at an average price of $6.50, yielding a gross income of $143.00. The cost in this case can be compared very favorably with that of a potato crop.

Digitized by Google

Mr. Wyman Elliot has a small patch of strawberries, 1-32 of an acre in size, from which he picked 230 quarts this summer. If they were retailed at ten cents a quart, the receipts would have been $23.00, or $736.00 per acre. His land is in an exceptionally good condition, and the plants were grown quite close together, but it gives you some idea of what can be done on a small scale.

From Mr. Phinney's figures, concerning vacant lot gardens in Minneapolis, I find that one man realized $158.25 from an eighth of an acre. Another obtained $165.45 from a plot one-sixth of an acre in size. The soil was in average condition, but every inch of ground was utilized. These men clerked in a shoe department and gardened at odd times, which averaged two hours a day. The products were sold at retail prices.

Not all of the cases cited are applicable to farm conditions. In fact, the cost on a half acre plot could quite often be reduced by the farmer. He could work in the garden at odd times, when because of rain, or for some other reason, he finds it too late to go to the field. In many cases the children can help, learning how to be useful instead of inventing mischievous pranks.

So far we have confined our attention to the market value of the products. The question naturally arises, how will this decrease the actual cost of living? B. W. Snow has answered this question in a comparatively recent issue of the Orange Judd Farmer. For three years he kept an account of the cost of his food stuffs. The first two years he had no garden and the average daily cost per man was the same each year, 35.4 cents. The next year he raised his own garden truck and found that he had saved 7.5 cents per day. For a family of eight this woud be a daily saving of 60 cents, or $219.00 per year.

The kitchen garden is deserving of your most careful attention. Do not put it off until the last minute, but get out your catalogs now and make your plans for the following spring. Aim to have all of the good things that you and your family like and plenty of them. One year's trial will convince you that you did not start soon enough.

Cabbage storing is rather simple and easy. The shrinkage is small. A cheaply constructed bank or hillside root cellar, or a basement under almost any farm building, is the only storehouse necessary. This should not be too dry and should be a place which could be kept at a temperature of about 40 or 50 degrees Fahrenheit in the early part of the season. This is often accomplished by opening the doors to let in the cool night air and closing them to keep out the warmer air during the remainder of the day. Later, of course, the doors must be kept closed continuously to prevent freezing.

Digitized by Google

Growing New Fruits.

AN EXERCISE CONDUCTED AT THE LATE MEETING OF THE SOCIETY BY CHAS. HARALSON, SUPT. OF MINN. STATE FRUIT-BREEDING FARM, EXCELSIOR.

Chas. Haralson: As this is a question and answer exercise I will not attempt to give you a talk on the subject, but would like to have you ask the questions. If I can answer them I will do so; if not, there are some in the audience who can.

Mr. Geo. J. Kellogg (Wis.): Tell us how we are going to get that thousand dollar seedling?

Mr. Haralson: We have nothing at present that will come near to it.

Mr. Kellogg: Will it not take twenty-five years to prove its hardiness?

Mr. Haralson: Yes, it will take all of that to get reports from all over the country, and to get reports from localities where hardiness is the main object. In the meantime, we might be able to get a good apple. There are some very good seedling apples down in the fruit rooms. Some of the fruit down there is of the very best quality in every way, but I do not know how the tree will be when put under propagation. It may take a long time to find out whether a seedling is worth while to propagate.

Mr. Kellogg: I believe you will get a number of seedlings that will come so near it in twenty-five years from now that you will have to divide the prize money among a dozen different kinds.

Mr. Husser: We have the Wealthy, and it is very hard to beat that.

Mr. Haralson: Yes, the Wealthy is a hard apple to beat. What we are looking for is an apple as good as the Wealthy, with keeping qualities of the Malinda and hardy as the Duchess.

Mr. Wedge: What sort of varieties would you say would come nearest to producing that kind of an apple?

Mr. Haralson: I would not say exactly; we have to try a good many combinations.

Mr. Wedge: Would you not naturally try what would seem to you the most promising?

Mr. Haralson: I would try such varieties as Duchess, Hibernal and others equal in hardiness as one parent; Jonathan, Delicious, Rome Beauty, etc., for the other parent, to represent quality and long keeping. If we can combine hardiness, long keeping and quality from such varieties, we may obtain the desired apple very soon. We are prepared to make thousands of crosses and combinations to obtain this much-desired apple.

With breeding plums I find the Burbank and Wolf plums make the best combinations of all the varieties I have tried. Nearly all the seedlings from these crosses have been bearing fruit equal to either parent. A large per cent of seedlings grown from seed of the Wolf plum will bear plums equal to its parent. When we find as good a combination in apples as the Burbank and Wolf are in plums, we shall soon have the $1,000 apple.

Digitized by Google

Mr. ———: I planted a lot of Wyant seeds, some that I selected from the trees, and this year is the first full crop that they bore, and there is not a single, solitary tree in the whole lot as good as the Wyant from which I selected the pit.

Mr. Haralson: I have had the same experience with the Wyant, and also with the Terry. If we want to get something better than Terry and Wyant we have to grow seedlings from something else. There was another plum called the Odegaard. It is not known very much. It was first introduced by H. T. Odegaard, of Brookings, S. D. It is a good plum and is equal to the best wild plum. We thought so well of it that while I was at Brookings we planted a lot of seed and grew several hundred seedlings from it, and out of the whole lot there was not a single one as good as the original.

Mr. Kellogg: What is your experience with the Brittlewood?

Mr. Haralson: I do not know anything about it.

Apple seedlings at the State Fruit-Breeding Farm.

Mr. Moore: It is one of the largest plums we have, and it is of good quality. However, it is something on the order of the Surprise —it will not bear fruit. I have had Brittlewoods old enough to bear for the last six or seven years and have not got any fruit.

Mr. Haralson: Talking about hybrids or crosses between the Wolf and the Burbank, we have close to 400 hybrids. There are about a hundred and sixty that are all good. These plums (indicating) were picked from two-year-old trees, so that they bear very early. They are something on the same order as Prof. Hansen's hybrid, the Skuya, and the Opata, and those sorts, only I think they are of larger size. They are more valuable commercially, and I think of better keeping quality.

Mr. Kellogg: When will you begin distributing those scions?

Mr. Haralson: As soon as we can propagate enough stock. We would rather send out trees than scions. Here is No. 21 (indicating), a seedling of Burbank crossed with Wolf, which has been propagated, and trees will be ready for next year. This is an early plum. It is ripe August 5th. It is a freestone, and specimens measure one and three-quarter inches in diameter. It has a very small pit. I think I sent Mr. Wedge some specimens of this plum. There are others better, but this is certainly very early and promising.

Digitized by Google

Mr. Wedge: It certainly is a fine plum, and it was a surprise to me when I opened the box Mr. Haralson sent me.

Mr. Haralson: Here is one, No. 12 (indicating). They are a yellowish red, red on one side and yellow on the other. Here is another seedling (indicating) I picked which measured one and three-quarter inches in diameter.

Mr. Wedge: Is that a Wolf seedling?

Mr. Haralson: Yes, they are all hybrids; it is the Burbank seedling crossed with the Wolf.

Mr. Husser: Has any one tried grafting on nuts?

Mr. Haralson: I am just starting to do that on a small scale. I am just getting the material together. I have not done anything so far except getting wild hazelnuts wherever I find any material that is good, and after a while we will do some crossing work with filberts.

Mr. Wedge: Have you done anything with the pear?

Mr. Haralson: I have done a good deal of work with the pear. I did a good deal last year and expect to do more next year.

Mr. Kellogg: What do you top-work the pear on?

Mr. Haralson: I have not done any top-working with the pear outside the greenhouse. I have been using the wild hawthorn as stock, but it does not make a good union. It heals all right, but the union is poor.

Mr. Husser: Did you say you used the hawthorn for pears?

Mr. Haralson: Yes, but it does not make perfect union, and I suppose the tree would be short-lived.

Mr. Pond: Will the pear make a union with the apple?

Mr. Haralson: It will, but I would not expect the tree to live more than two or three years.

Mr. Husser: Have you used the mountain ash?

Mr. Haralson: I have, but it does not make a good union.

Mr. Husser: Have you been doing anything for pear blight?

Mr. Haralson: I don't know of anything to do except cutting out the wood that is affected.

Mr. Wedge: Cover the tree with netting so that the insects cannot get at it. How is that, Prof. Beach?

Prof. Beach: That is one way but not the only way.

Mr. Kellogg: Will not the air or the wind carry the germs through the netting?

Prof. Beach: Speaking of the pear blight germ, the pear blight holds over winter in the margin between the old blight and the new wood, and in the spring when the sap starts to flow little drops will ooze out, and if you keep bees they will carry that liquid into the blossom of the pear when they are looking for the nectar of the blossom. The pear blossoms furnish the best possible place for the germs. Insects that crop the tender young twigs may carry the blight in that way from one tree to another. It comes in different ways, but I think the principal way in which pear blight is distributed is through insects.

Mr. Pond: Is the blight germ of the apple and pear identical?

Prof. Beach: Yes.

Mr. Kellogg: We have had a singular experience with an apple tree. Sometimes the whole tree is blighted and will not bear anything;

Digitized by Google

sometimes it will go to work without any fussing and give us a good crop.

Prof. Beach: There is a great deal of difference in the susceptibility to blight. We have some pear trees that will not blight.

Mr. Cox: Dare you name them?

Prof. Beach. Why, certainly. One is the Fluke pear. It comes from the old French strain, and it was sent to me under the French name, but because it stood in his dooryard we asked the Horticultural Society of our state to change the name to Fluke, and we call it the Fluke pear. That pear seems to be remarkably blight resisting. It is only of medium size and only of medium quality. We have another one, the Orel No. 15; that is Russian. We have that still standing in

An attractive nook in T. E. Perkins' Malinda seedling orchard, at Red Wing.

the orchard, and it is one of the very few trees that has remained since the pear orchard was planted in 1888. At first we had a number of pears planted, but the trees blighted badly, and then later a blizzard came along which swept everything else away except the Fluke, and that stands away over on the other side of the orchard. Mr. Patten has seen it and knows that it is remarkably free from blight. It seems also to be perfectly hardy. They have a weather bureau station at Charles City, and that office holds the record for cold in Iowa, and that pear stands in Mr. Patten's grounds, vigorous, healthy and free from blight. So we are using these two pears.

Mr. Gardner: How about the Longworth?

Prof. Beach: It is very vigorous and hardy, but it does not bear.

Mr. Gardner: I have one thirty feet high that has borne for fifteen years. Some years it has borne a heavy crop.

Mr. Wedge: I would like to ask Mr. Haralson whether he has had any success with the Beta seedling grape, and whether he has succeded in fruiting any. Mr. Pfaender told me he thought it had been introduced by crossing with the Concord.

Digitized by Google

Mr. Haralson: There is some domestic blood in the Beta grape, but I do not know whether it is Concord or whether it is Brighton. Ten per cent would be straight domestic type, foliage and bunches are a little more compact, of which only a small percentage are hardy. There is a large percentage of these seedlings that are not hardy. Probably one in a hundred are hardy; the rest are rather weak and do not amount to anything. As the real Beta seedling comes pretty true to seed in most cases it is desirable to plant it. Just about the same size of berries and the same quality and so forth. There is an occasional vine that has a little larger berry than the Beta and probably a little better quality.

Mr. Gardner: Are those that come true to name from seed hardy?

Mr. Haralson: Yes, same as the Beta, or even more so.

Mr. Wedge: Have you any that are a distinct improvement upon the Beta?

Mr. Haralson: Yes, I think we have quite a few that are better and are larger bunches than the Beta, and also have larger berries, and I think they are of a better quality.

Mr. Wedge: How many seedlings have you grown of the Beta?

Mr. Haralson: I think we have some thirteen thousand on the place. We have fruited some six hundred and out of these there are over one hundred that I consider better than the Beta.

Prof. Beach: Were the blossoms protected so no outside pollen could get in?

Mr. Haralson: I don't think they were protected, the seed was gathered at the station. I think there is a very small chance of getting mixed with any other variety, as they blossom nearly two weeks earlier than the Concord and other varieties.

Mr. Wedge: You had some that were crossed, if I remember rightly, with the Brighton?

Mr. Haralson: Oh, yes; we have several thousand, but they have not come into bearing. I think, however, they will start in next year.

Mr. Husser: Don't you think the blight can be overcome by proper pruning of trees? We have in our neighborhood some Transcendant crabs, and the man pruned them quite severely, and it looked as though he had given the trees pretty rough treatment, but they did not blight, while the next neighbor's blighted badly.

Mr. Haralson: I want to say that I do not know very much about blight because I have never had very much to do with it.

Col. Burnap: My experience in the treatment of blight shows that the best method to apply is to take the axe and trim the tree off just below the ground. (Laughter.)

Mr. Sahler: What is the matter with a plum tree that does not grow for five or six years?

Mr. Haralson: Well, I don't know, but any tree that stands in ground where water collects will not do well.

Mr. Sahler: It is not on low ground, but it is on rich ground. I have a Northwestern Greening apple tree that is the same way.

Mr. Wedge: I want to ask Mr. Haralson how his ever-bearing strawberries are doing at the station.

Digitized by Google

Mr. Haralson: I have been working on a different proposition on ever-bearing strawberries than other ever-bearing strawberry breeders. I have been using as one parent either the Senator Dunlap or the wild strawberry from Alaska. I have quite a quantity of very good seedlings. They make plants just as good as either the Alaska or Senator Dunlap itself. They seem to be very productive, but only a small percentage of seedlings turn out to be ever-bearing.

Mr. Gardner: How is the Alaska itself?

Mr. Haralson: It is a small berry, has good foliage, is a good plant maker, and the berries are a little larger than the native grown in this part of the country.

Mr. Gardner: Is it a continuous bearer?

Mr. Haralson: Yes, I think it is; anyway I found some this fall. They are different in that the blossoms do not come in a cluster, the blossoms come on a single stem from the plant. I expect good results using the Alaska as stock for breeding ever-bearing strawberries.

Mr. Gardner: Have you used the Pan-American?

Mr. Haralson: I use it with the Senator Dunlap and the Alaska.

Mr. Gardner: What is the result of those crosses?

Mr. Haralson: I have got quite a number of good seedlings. They bore some fruit this fall. I would not be surprised if some one could dig up a few strawberries under the snow at this time.

Mr. Sahler: On good soil how old will a plum tree be?

Mr. Haralson: I think a plum tree will grow as long as you take care of it.

Mr. Sahler: Well, what if you give it good care and then it dies?

A cluster of No. 108, one of T. E. Perkins' most valuable Malinda apple seedling.

Mr. Haralson: In most cases our native plums have been affected with disease on the foliage for several years. This disease is killing our plum trees. If spraying is done every year there will not be be so much of it, and the trees will do better.

Mr. Sahler: When a tree gets sunscald is there any remedy to overcome that after it has started?

Digitized by Google

Mr. Haralson: I do not think so; I would cut a tree down if it was sun-scalded.

Mr. Sahler: What if it is a valuable tree?

Mr. Haroldson: I would cut it down anyway, better dig it out and be done with it.

Mr. Philips: Any tree that is killed by sunscald is not very valuable.

Mr. Sahler: Well, what if there is fruit on them?

Mr. Philips: They don't bear much after they are sick.

Mr. Wedge: A neighbor of mine wants to know if there is any other way of producing a hybrid except by crossing the blossoms?

Mr. Haralson: I don't know of any. There has been quite a lot of work done in trying to unite the buds, and I have been working quite a good deal myself, but I don't know whether it can be done or not. Prof. Hansen can probably tell something about that.

Prof. Hansen: I have come to the conclusion that the less I say now the less I would have to take back afterwards. We have a number of hybrids. We have chopped out a great number of them because there were two shoots from the bud. Each half of the bud made its own part of the tree, but we have a number left that are intermediate. It is a difficult thing to do, but I would not say that we would not be able to graft a hybrid.

Mr. Jordan: Where can we get hardy apple seeds for root grafting? Something that will not freeze and thaw to death in our dry soil.

Mr. Cashman: We have been selecting seed from native stock, Duchess and our native crab apples. We have none for sale, but if the gentleman wants to experiment with stock of that kind we will furnish him some seed. Seedlings of this class have not winter-killed when left out. We have had no trouble with those old seedlings from Vermont.

Mr. Kellogg: I want to contract with the society five years from now to furnish them with strawberries for the annual banquet. Five years from now at the winter meeting I will furnish you with strawberry shortcake. (Applause.) There has gone out a wrong impression as to what I said in the paper that I read. They made me say that I offered strawberry plants that would yield two thousand quarts a year the first year, that is, two thousand quarts to the acre. I didn't say any such thing.

Mr. Philips: Oh, well, I have heard you tell bigger stories than that. (Laughter.)

Mr. Kellogg: The fact of the matter is that a man did grow from five plants something like five quarts of berries, and at that rate an acre would yield over two thousand quarts. That is what I said.

Rhubarb for winter use may be dug just before the ground freezes hard in the fall. Leave the plants on top of the ground, slightly covered with hay, or something to prevent their drying out, and allow them to freeze for several weeks. About Christmas time the roots may be taken into the cellar, or other dark, moderately warm location, and buried in just enough soil to cover the roots. Water and allow the plant to grow.

If rhubarb is grown in the dark, the stalk is tender and very little leaf surface is formed. Plants thus forced are of little value for setting out.

Digitized by Google

Small Fruits.

A "QUESTION AND ANSWER" EXERCISE LED BY E. B. MILLER, BLOOMINGTON, AT THE 1911 ANNUAL MEETING.

Mr. Miller: I don't know that I can tell you anything new, but, as I understand it, I am simply here for the purpose of answering questions and not to tell you anything that I don't know. (Laughter.)

Question: Who originated the Perfection currant?

Mr. Gardner: It was originated in New York, but I don't know by whom.

Question: Is the Perfection currant the best for commercial purposes?

Mr. Gardner: It was sent to me by the originator several years ago. It is the largest currant I ever grew, and it has never failed to bear well with me. The berries are very large, and they have long stems, but I do not know of any place where anybody has them in any great quantities so that they can be tested as to their commercial value. I myself have only perhaps three hundred.

Question: What is the difference between the wild and the tame Juneberry?

Mr. Gardner: The only difference between the wild and the tame is that the wild one is dug up out of the ground in the woods and is brought under cultivation. I have grown them in that way for the last twenty years. There is no difference between the wild and the tame, except that the wild is put under cultivation, and under that condition it bears better and is larger than the wild.

Question: Has the Himalaya berry and also the Logan-berry been grown successfully in this state?

Mr. Miller: I saw the Logan-berry in Oregon and in Washington, and it was a very fine berry. I expect to have some roots next spring.

Mr. Plants: Some years ago I tried the Logan-berry, and it made a very fine growth. That winter it partially killed, and I had them covered with marsh hay but not very deep, but it started to grow in the spring and made quite a good growth. That winter it partially winter-killed the second time, and the third winter it was covered up well, but it killed out entirely. That is the experience I had with the Logan-berry.

Mr. Miller: I am sorry to hear that.

Mr. Plants: No, sir, they are not hardy at all.

Question: Will gooseberries yield as well planted in a single long row as if planted in short rows?

Mr. Miller: The person who asked that question evidently wants to know if a hundred plants set out in a single row will do as well as they would if set out in ten rows with ten plants in each row. It struck me when I read the question that perhaps a single row well cultivated might do as well as four rows, but in my opinion the plants will get more fertilizing if set out in several rows.

Digitized by Google

Mr. Gardner: Yes, I think that is a good answer.

Mr. Miller: That is the only thing I can see that would be of advantage.

Question: How long is it profitable to raise blackberries from a field after it bears its first crop.

Mr. Plants: I set out a plantation of perhaps half an acre and fruited them for three years; then I sold the place to Mr. Redpath, and he fruited them up to a period when they were twenty-one years old, and they were bearing a good crop when he plowed them up. He claimed the year they were eighteen years old they yielded at the rate of six hundred quarts per acre.

Question: Can mildew be controlled or kept in check in Minnesota on the gooseberry?

Mr. Miller: I do not know. I do not grow them enough to tell from my own experience. I presume, however, with a spray for that purpose the mildew could be kept in check.

Mr. Sahler: Coming back to the blackberry, I have grown the same lot of Ancient Briton blackberries for fourteen years, and to my surprise and astonishment they bore berries the first year, and they have continued bearing every year since for fourteen years. The plants are very thrifty, and they have never been given any protection during all that time.

Mr. Miller: Well, that's the kind to have, but not everybody has them.

Question: Are the Senator Dunlap and the Bederwood strawberry considered hardy?

Mr. Miller: I have never grown the Bederwood, but I have the the Dunlap, and I consider it hardy.

Mr. Gardner: The Dunlap is hardy almost anywhere.

Question: What can one do with a strawberry patch where the cutworms eat up the plants in the spring before the leaves are thick enough so one can put poison on them?

Mr. Miller: I would answer that question by saying that we must put poison on some other green stuff so the worms can get it.

Mr. Sahler: What kind of poison would you use?

Mr. Miller: Paris green mixed in a paste of bran and molasses. Put it on cabbage leaves or clover and strew it around the plants; they will eat anything that is green.

Mr. Murray: Don't you sweeten it?

Mr. Durand: Yes, you can use molasses. I generally take a few clover leaves and put a little molasses in and sprinkle that around in the rows.

Question: Would not leaves make a very good covering for strawberries? They would be free from weed seed and could not be made to lie as close as some other covering, and by putting a little straw on them they could very easily be held down.

Mr. Miller: The only objection would be that they would pack too closely, especially if they got very wet.

Mr. McCulley: They are a hard thing to hold. I use a great deal of leaves for mulching on stawberries and other things. I find that I have got to put straw on them to hold them down.

Digitized by Google

Mr. Gardner: It depends greatly on what kind of leaves they are. I have strawberries mulched with pine leaves, and they are not moved at all by the wind.

Question: Is late in the fall or early in the spring the best time to mulch a strawberry bed?

Mr. Miller: The way I have been doing is to wait until the ground is sufficiently frozen to hold up a team, and then drive over with the mulching and spread it. Sometimes I have to wait too long for that to come. I experimented a few years ago and found that after the first snow fell was as good a time as any. If you want later berries there will be snow under the mulching, forming an ice bed, and the plants will not start early, and then when you uncover you have moisture there as well as your plants.

Mr. Reel: I tried that for one or two seasons, and the water ran down into that snow between the mulching and formed an ice pack, and it killed off my berry plants in some way.

Mr. Miller: Perhaps there was an excessive amount of moisture or low ground and heavy soil.

Mr. Reel: I don't know how that was, but I know I had it happen twice. I waited until four inches of snow had fallen, and then I covered the strawberries. We had an early thaw in February. That formed a solid pack of ice, and then when spring came they were all killed out.

Mr. Miller: One point in regard to spring mulching. Sometimes we have a thaw in the middle of the winter, and that thawing out is very injurious to the plants.

Mr. Plants: My experience has been the same as that of the the other gentleman. I have tried for a couple of years, and I have found where snow came before covering, the alternate thawing and freezing formed quite an ice crust over the plants and often killed them. I have done that twice in my experience, and it injured the crop very much, in fact the crowns were nearly all injured by the ice.

Question: What is the best variety of black raspberry to plant on heavy black soil?

Mr. Gardner: Is there any better black raspberry than the Minnesota black raspberry? I think that is the best berry there is for the market.

Mr. Miller: Do you find it successful?

Mr. Gardner: What I mean is the black raspberry found in Minnesota, and we have it wild in Iowa. I don't believe you can find anything better than the wild ones.

Question: Is there a hardier red raspberry than the King? Mine killed back in winter.

Mr. Gardner: Mine do not.

Mr. Miller: I think in our fruit list report it is considered as hardy as anything we have here.

Mr. Ohler: It is not as hardy as the Sunbeam.

Question: Is the everbearing strawberry a success in Minnesota?

Digitized by Google

Mr. Wedge: We fruited them at our place this year, and there are certain varieties that appear to have all the good qualities that could be desired. The best variety I have had is what is called the Rockhill No. 16. The Iowa is good but made few runners.

Mr. Gardner: You have a man at the state experiment farm who has been experimenting with these everbearing berries for several years, and from what I can learn from him and others he has got as fine a showing as anybody in any state. That is Mr. Charles Haralson, the man who is in charge of the state farm.

Mr. Plants: What is the name of the variety?

Mr. Gardner: He takes the kind that Mr. Cooper originated —and that is where all kinds that are good come from. Mr. Haralson has that same kind, and he has crossed them with the wild strawberry, and I believe he is going to get some great results. While I am on my feet I want to say that he came down to Des Moines last winter and told us about his work. I had him tell it for the benefit of our members. You have a man out there you can depend upon, and he is an expert.

Question: What is the cause of "curly leaf" of red raspberries particularly, and what is the remedy?

Mr. Murray: Dig them up.

Mr. Kellogg: I should spray them with kerosene emlusion.

Mr. Miller: That would only control the aphis.

Mr. Kellogg: Yes, you spray them good and thoroughly, and you will not get it.

Question: Is crown gall injurious to raspberries, and how is the best way to control it?

Mr. Miller: If you have a patch of it dig it out and cultivate the ground some years before you set raspberries there again.

Mr. Kellogg: If you will cultivate that ground for five years it will do a great deal better.

Question: Is there any remedy for the large warty growth on the Columbian raspberry?

Mr. Miller: If I had written that question, I would have specified all raspberries. We have heard considerable here about crown gall on roots. You want to dig up the entire patch and burn the brush. I consider that the only good remedy that can be employed is to dig up and burn them and in that way get rid of it.

Mr. Gardner: Is that the same thing that we find on the wild rose bush, what we find at the roots of the wild rose bush?

Mr. Kellogg: I don't think it is.

Mr. Jennings: Is that which is found on raspberries and blackberries the same thing?

Mr. Miller: I don't know. I have been told that is a different species of the disease. I am not sufficient authority to answer that question. I have also been told that the crown gall on the raspberry roots would not affect the apple orchard. That is said to be a fact, but from my own experience and knowledge I don't know.

Mr. Gardner: The reason I thought that was the same thing was I set a lot of apple grafts on ground infested with wild rose

Digitized by Google

bushes, and we had to dig them all up because nearly every root had root gall.

Question: Is the Carrie gooseberry meeting the expectations of growers in the way of quality and as a fruit producing plant?

Col. Burnap (Iowa): It meets my expectation. I don't know whether it does those of other people or not.

Mr. Miller: You believe then it is well worth setting out?

Col. Burnap: Yes, sir, I do. I wonder if there is any one here who grows it?

Mr. Kellogg: There must be twenty-five or thirty persons who raise it.

Mr. Wedge: I want to ask for a show of hands. Yes, evidently, quite a few grow it. It is a vigorous grower and a good bearer. It has the healthiest foliage of any sort I ever had.

Mr. Plants: The berry is all right, but the color is against it. Our market wants a green berry and this is red, and when we put it on the market it will not compete with the evergreen on account of its color and size. The evergreen berry is much larger and the markets look for a large and evergreen berry.

Question: Is the Russian mulberry a failure in Minnesota?

Mr. Miller: From my knowledge it is a failure.

Mr. S. D. Richardson: In Winnebago I have a row of Russian mulberries planted twenty-six years ago, and I call them a success. They make a very fine appearance. As a windbreak they will stand more snow than anything else I have ever planted. It is a good thing to feed birds in place of late cherries.

Mr. Kellogg: Does it not bring birds in such numbers that they leave the mulberry for other fruits?

Mr. Richardson: When you fill a bird up on mulberries there is not room for anything else inside.

Mr. Wedge: There is one thing that ought to be taken into consideration in connection with the Russian mulberry. I think it has been propagated only as a seedling, and in the seedling there is as much in hardiness as in apple seedlings or more. I think if you would go to the trouble to seek out seedlings that are really valuable, we would find that we have something good in the Russian mulberry. The fruit also varies as much as the tree does. I have seen a Russian mulberry somewhere between Owatonna and Faribault, a single tree ten inches in diameter. We had one at Albert Lea that was blown over that was about the same size. It is a tree that possesses considerable hardiness. I believe it is a good thing, and we ought to go after it.

Mr. Richardson: I have the Russian mulberry that fruits well and is hardy, but I have never propagated it, because I do not believe I would get any pay for it.

Mr. Miller: I had some on which the branches killed so terribly that I did not like the looks of it, and I took them all out. They only bore fruit once or twice, and the birds took all that.

Mr. Richardson: They should be planted four or five rows together and not in a single row. I have some along the railroad

Digitized by Google

track, and where there was a single tree they killed out, but where they were planted together they did all right. I believe if they were planted in the form of a grove they would not kill out.

Question: Is the fruit of the Beta about the same size as the Concord and other grapes?

Mr. Miller: About the same.

Mr. Kellogg: I should say they would be better because they are so much earlier.

Mr. Gardner (Iowa): Mr. Patten had a large quantity of them.

Mr. Wedge: I wanted to find out who is growing them. We grew a thousand pounds of them this year and marketed a large share of them as green grapes. We marketed the whole crop for five cents a pound. I think it can be made profitable as an early market grape. Of course it cannot compete with the Concord, although it can be put on the market in as good condition, but it will nearly rank with the Concord.

Question: Has any one ever tried to any extent painting a fruit tree with white lead to insure against injury by mice and rabbits, and is the tree injured in any way?

Mr. Miller: I have never tried white lead, but almost any substance that is obnoxious to mice or rabbits will answer the purpose. Do not think white lead would injure the trees.

Question: Please give the entire list of fruits, berries, etc., to grow with profit in Minnesota.

Mr. Miller: That is too much for me, and I must refer the party who asked the question to last year's report, that is to the fruit list that was adopted, and that will give him definite answer as to what are the best varieties of small fruits to grow in Minnesota.

Mr. Kellogg: Speaking about small fruit, the Pearl gooseberry is the best gooseberry I have.

An excess of water in the soil at any time is never advantageous to trees, but rather injurious and should be removed by drainage, and the sooner the water is removed in the spring the better, for then cultivation can begin, and after it begins it is desirable not to have any great loss of moisture other than that which is taken in through the roots of the trees. Each rain will destroy this soil mulch; so then cultivation should begin as soon after each rain as possible in order to restore this mulch.

During a dry period or a prolonged drought the soil mulch will largely lose its efficiency if not renewed at intervals of from ten days to two weeks. Therefore, during the season of two or three months, ranging from, say, the middle of April to near the end of July, it will be necessary to cultivate as soon after each rain of consequence as possible. These cultivations should be as frequent during this season as every ten days or two weeks whether there is rain or not.

Digitized by Google

Three Hardy Perennials for Minnesota.

J. P. BROWN, EXCELSIOR.

I have been asked to say a few words about the three perennials which from my experience in growing I think the best for this climate.

My first selection is the peony, which I think you will all agree with me stands at the head, as it possesses all the essential points necessary to make it one of the most desirable flowers grown, whether of the perennial class or any other class. In beauty of color, form and fragrance, it equals the rose. The foliage is beautiful. Its hardiness is not surpassed, its ease of culture makes it desirable for those who haven't the time or inclination to devote to the growing of many flowers. They come in so many colors that all tastes may be pleased, and there is no flower possessing so many different kinds of fragrance.

The peony is propagated in three different ways, from seed, by root division and by grafting. To propagate from seed, gather the seed the latter part of August before they become brown and dry and plant as soon as gathered about two inches deep. A few will germinate and come up the next spring after planting, but the most of them will wait until the second spring. About the fourth year they will begin to bloom, but the blooms will be small and mostly single the first year. Some will never improve, while others will go on improving for three or four years until you have a glorious flower. Never select seed from a poor variety, as they will nearly always produce a poor variety. Peonies reproduce themselves more nearly than is generally supposed.

To propagate by root division, divide so that each root will contain a bud. Plant with the bud about three inches below the surface of the ground. The best time to divide the peony is the latter part of August. Peonies propagated by root division always produce the same varieties.

My experience in grafting the peony has not been such that it would be of any value to you should I relate it.

The varieties of peonies are not many, but the names are legion. A person plants a seed of some well known variety and gets a seedling identical with its parent; he gives it a name and exploits it as a new peony, asking many times the market price of its parent. Take for instance, the old, well known peony, L'Esperence. I have no less than five identical with this under different names, costing me many times what the L'Esperence

Digitized by Google

would have cost me. I know of one grower offering a peony under a certain name asking many dollars for it, and I can see no difference in it and an old variety than can be purchased for nine cents. So my advice to the amateur is to go slow on new, high priced kinds, as there are enough fine varieties at moderate prices to satisfy the average grower.

In the whites the following may be had at reasonable prices and are about as good as can be had at any price: Marie Lemoine, Madam Crousse, Festiva Maxima, Coronna d'Or, Lady Derby.

In pinks: L'Esperence, Dr. Brettoneau, LaTulipe, Marguerite Gerard, Livingston, Floral Treasure, Triumph duNord, Humei, Asa Gray, Mons Jules Elie, Lady Carrington, Dorchester, Eugene

Mr. and Mrs. Brown at home among the flowers.

Verdier. The last named is in my opinion the finest peony grown.

In reds: Louis Van Houtte, Richardson's Rubra Superba (a beautiful flower but a poor bloomer), Grandiflora Rubra, Felix Crousse, Francois Ortegal, Mons Krelage, Rubra Triumphans, Eduard Andrea, Mons Crousse, or American Beauty.

My second choice of a perennial is the delphinium. I wish I had the eloquence of some of our members to describe this flower, its many shades of blue, the opalescents, whites, creams, etc., all beautiful; blooming from June until frost, some with flowers so close together that at a distance it looks like one cone-shaped flower one to three feet in length, others open and airy, but all very very beautiful. There is no flower that gives the finish to a bouquet or to the garden like the delphinium. It is easily grown from seed, many blooming the first year. They are hardy. They may be grown in many situations that would not be suitable for a less stately flower. Seed from one plant will grow more different shades and varieties than any other flower I know.

Digitized by Google

The delphinium is propagated both from seed and root division. The seed may be gathered as they ripen and sown either as gathered or kept until spring and then sown. If planted in the fall the small plants need some protection through the first winter, after which they need no protection. If planted early in the spring the plants need no protection through the winter. Unless you are saving the seed, cut down the bloom stems as soon as the bloom has fallen, and the plant will send up shoots that will soon be in bloom again and will so continue until frost, so there will be no time between June and frost that you cannot cut blooms.

Plants of the delphinium may be had very reasonably, but I would advise that you send to some reliable dealer and get an

Across the edge of Mr. Brown's peony field.

ounce of seed of Burbank's and Kelway's strains, which will cost you but a little. Plant them, and in the fall you will have a fine line of plants. As in peonies there are many named varieties, but you will get most of them from seed and not have to wait so long for results as in the case of the peony.

It was rather hard to make up my mind as to the third selection as there are so many good ones, but after considerable thought I selected the phlox. You all know what they are, have seen them in nearly every yard. They are showy, hardy, a very good cut flower, increase rapidly and in every way are satisfactory. They bloom over a long period and bloom almost constantly from June until frost. The phlox is propagated from seed, by root division and from cuttings. To propagate from seed, the seed must be gathered as soon as ripe and planted at once in an open, exposed place. In the spring all sound seed will come up, and by fall many of the plants will bloom. Phlox many times reproduce themselves true from seed, but you will get some that vary; so there is a

Digitized by Google

pleasure in growing them from seed, as you will get many new varieties. If the seed is kept until spring before planting, very few if any will ever germinate.

Varieties: Richard Wallace, Coquellicott, Esclamonde, Miss Lingard, Purity, Livingston, Gladstone.

Mrs. Gould: Do you find the plants grown from phlox seed come true to color?

Mr. Brown: Not always.

Mrs. Gould: Usually, do you think they do?

Mr. Brown: They come very nearly true to color, but there is always enough variation so there is a pleasure in growing them.

Mr. Underwood: Is there anything that comes into bloom before the peonies that is desirable?

Mr. Husser: The iris comes in and fills the place between tulips and daffodils.

Mr. Brown: There are few varieties that bloom before the peony.

Mrs. Tillotson: The German iris blooms just before the peony.

Mr. Emmans: Do you favor mulching the peony?

Mr. Brown: I do not.

Judge Moyer: I think the phlox is a good thing to come in early. It propagates itself and does not need attention and is beautiful.

No Hardy Trees without Hardy Roots.

A. BRACKETT, FRUIT GROWER, EXCELSIOR.

I will first give you my experience. I was born in southeastern Iowa. My father was in the nursery business, and that has been my life work. We moved from south-eastern Iowa to western Iowa and there continued in the nursery business. There we had our first experience with root-killing. We planted out an orchard of some 500 trees and kept them in good cultivation, as we had been in the habit of doing. The trees made a very rank growth on that rich soil and went into winter quarters in a very sappy condition. We had an open winter without snow, and that winter we lost about half of our orchard, a part of which was root-killed and the more tender varieties top-killed. I well remember two rows that had gooseberries and currants growing between them, having more or less grass and weeds among them, which came through the winter uninjured. My next experience was at Mitchell, S. D., during those dry seasons sixteen years ago. I had moved my nursery stock

Digitized by Google

and planted it out there. The first winter the ground was very dry and very severely cold, and all of the apple trees and most of the other stock was destroyed by root-killing. Those who had trees that were in reach of city water and kept them watered and gave a mulching in the fall brought their trees through uninjured.

My next experience was at Excelsior. Ten years ago I bought and planted 100 apple trees and gave them good cultivation until they came into bearing. They commenced dying off from root-killing, until at the present time I have only about half of them left, and those that are left are on their own roots, having rooted above the graft.

I contend that there is more profit in growing apples in Minnesota than in most of the states, but they must have special care in protecting the roots until it is possible to get hardy roots. I should advise deep planting and heavy mulching in the fall, but be sure to remove the mulching in the spring. It is very unsafe to get an overgrowth, especially on such varieties as the Transcendent crab and the Wealthy, or in fact any variety that is subject to blight. Eight to ten inches growth per annum is all that is safe on varieties that are subject to blight, and the only certain way of controlling the growth is by seeding down, and then if the trees do not make a suitable growth we can encourage the growth by spading up around the trees. In case of drouth it is a good plan to mulch the trees.

Mr. Sahler: I would like to have Mr. Brackett tell me whether the Siberian crab is hardy everywhere.

Mr. Brackett: Have you ever heard of winter-killing in Dakota of the Pyrus baccata? I would like to ask Professor Hansen that question.

Prof. Hansen: I have not, and I have been where the Pyrus baccata is native, near the head waters of the Amor river, where the temperature goes from fifty to sixty below zero. It is a native there and is the hardiest apple tree on earth. Up in Canada our friends think that the only things you can have orchards of are the Siberian crab. When you get this blood diluted with the common apple blood, we may or may not have what we want. I think in the larger part of Minnesota the hybrid crab apple will be hardy enough, but farther north I think the pure Siberian crab is the only thing that should be used or can be used. I tried the Vermont apple seedling with the crab and both are dead—one might be deader than the other, but they are both as dead as they can be. (Laughter.)

Mr. Sahler: I would like to say a word about my experience in planting trees deep, planting them deeper than they stood in the nursery. You will find by planting trees deep they will throw out

Digitized by Google

natural roots. Anything that is above ground will not force out any root, but by planting them from seven to twelve inches deeper than they stood n the nursery, the tree will form natural roots, and the tree will do better, it will live longer, it will bear a better apple and will do better in every respect. I used to plant them the way I was recommended to grow them by the nurserymen, that is about three inches deep, and I lost a great many trees, but after planting them the way I was advised to plant them by a German farmer, the way he said he planted them, I never lost any. He planted them from eight to twelve inches deeper than they stood in the nursery, and he was never troubled with winter-killing.

Mr. Brackett: I think people generally are satisfied that deep planting is what we want and need, but you will find that a tree planted a foot deep, or a foot deeper than it was in the nursery, will not make much growth the first years.

Mr. Larson: Would you recommend planting seed of the Hibernal and Duchess to grow roots?

Mr. Brackett: Certainly I would if I could get them in quantities. The seed commercially planted is obtained where they make great quantities of cider. Speaking about cider, I want to tell you something that I learned last evening. If you want to make cider that will keep just as long as you want it to keep, run it through a cream separator. You will have cider that will be nothing but cider, there will be no impurities in it, and it will keep just as long as you want to keep. That is an easy way to prepare cider and remove every speck of pumice there may be in it.

Mr. Sahler: Cider can be kept just as well by boiling from twenty to thirty minutes. If it is boiled a little while, it will keep just as long as you want to keep it.

Mr. Brackett: Yes, that will keep it, but it injures the flavor of the cider to boil it.

Mr. Underwood: I do not want to leave this question of root-killing. I note Mr. Brackett says he lost everything that he planted because he planted it on a dry location, but in a place where the roots had moisture they did not kill. That is just where I want to stick a pin. The whole gist is if we furnish plenty of moisture we will to a great degree eliminate root-killing. I will not attempt to say that it can postively be controlled by moisture, but in my opinion the whole subject of the hardiness of trees of any kind, or shrubs of any kind, depends upon their power to resist drouth, and the whole question of the killing of trees and shrubs can be simmered down to that one word—drouth. If you furnish enough moisture in the atmosphere and in the soil so that your roots will get plenty of moisture, you will have the same conditions as in western New York, where they do not get anything of that kind. This is a dry climate. I have kept drumming away on this subject of drouth for some time, and I presume some of my friends are getting pretty tired of it. I want to say to you once more, if you will furnish trees and roots with plenty of moisture you will just about eliminate all root-killing, and also top-killing, of good trees.

Digitized by Google

Mr. Brackett: Mr. Underwood is certainly right in this respect. If a tree has got a reasonably hardy root, it will stand this climate, but a tree with a tender root, I will not say to what extent but to a certain extent, it will winter-kill, wet or dry.

Dr. H. M. Speechley (Manitoba): Is there anything in planting trees in an orchard with the aid of dynamite? There are some soils that consist of a very hard pan, and I would like to know whether it is of any advantage to dig that soil deep, to loosen it up deep, so the moisture can get down there. In certain localities they are doing a good deal of that, that is with the aid of dynamite, and I was simply wondering whether it needs to be done in Minnesota.

Mr. Philips: I am interested in these boys here. I do not want them to go away from this place with any wrong ideas. If my experience of thirty-five years is worth anything, I want to tell them that I do not want them to go away and think that the place to get apple seed is a cider mill. It is the worst place in the world to get them. All the poor, miserable, worthless stuff goes to the cider mill. You might just as well get your seed wheat out of the screenings. I have a neighbor who has a hundred good seedlings, and nearly every tree bears a good apple. But he did not get his seed from the cider mills, he carefully selected his seed from apples from his best trees. Don't go to the cider mill to get your seed. (Applause.)

Prof. Hansen: Mr. Underwood asked a question a while ago which has not been fully answered. "Where could we go to get a million hardy roots." I would like to attempt to answer that question. I do not know where they can be gotten at the present time. The whole question is in a ferment, and we hardly know where we are at. We go to a cider mill, and we do not know where we are at. and half the time the seed does not grow because of the apple acid that is in it. I get a barrel of crab apples here and there and take the seed out of that pumice just as soon as it is ground up. You can make a machine out of a section of a fence post and stud it with spikes, putting a handle on it, and you can run them right through into a hopper. Just take a common fence post and put spikes into it, and you will find it is very easily made. The thing to do is to get the seed out of the pumice before it ferments. Now in regard to those apple trees. The question is, how are we going to get over this formative stage. The best advice is to mulch your trees every fall. In dry falls you want to water your trees. That gives the needed moisture to the roots and prevents winter-killing. Seed out of the hardy apples is not always a sure thing; I have seedlings of our best apples that winter-kill, sometime all of them.

Only fully ripened and cured onions should be stored. Others are subject to too great danger of loss from rot and shrinkage. If onions are of proper quality, however, shrinkage in storage will be slight.

Digitized by Google

Co-Operation.

HAROLD SIMMONS, FRUIT GROWER, HOWARD LAKE.

On top of all the learning of colleges and trade schools, it is generally found that a post graduate course in the university of hard knocks is of inestimable value.

There have been very few if any text books to obtain first-hand knowledge of the problems of fruit-growing under our climatic conditions or of marketing the product. However, the healthy

Residence of Harold Simmons, at Howard Lake, Minn.

growth of the State Horticultural Society, its annual get-together of the members, coupled with the distribution of the monthly bulletins issued by the society, disseminating knowledge from that same school of "hard knocks", is destined to put Minnesota where it should be, and not "fortieth" among the states as an apple producing state, where it is at present according to the statistics of the last census.

It is now a fairly well accepted fact that Minnesota has graduated from the "preparatory school" to the "commercial school" of apple production.

Orchards of a thousand to two thousand trees are becoming numerous, and growers must of necessity put in more time and

Digitized by Google

thought into the marketing end of the business. The doing business in "happy go lucky" style must rapidly go out of fashion, and co-operation takes its place. Eventually it must be so, and the sooner the better for every fruit grower. Not a one-sided co-operation, but co-operation of all parties interested, not simply shippers with shippers, dealers with dealers, or retailers with retailers, but all of them together should co-operate and keep posted on the business methods of the trade, and profit by each others' experience.

Gathering fruit in Mr. Simmons' orchard—Howard Lake in the background.

The following of this course is bound to greatly reduce what we might term illegitimate losses, occasioned by unfair practices.

No grower can afford to neglect any system or be without any information that he can secure at any reasonable price, and it is noticeable that the most progressive growers are allying themselves with their fellows for the purposes indicated, and in their union have the strength to weed out the undesirable risks that cannot be accomplished individually. Such co-operation is sure to be productive of the best results.

The year 1911 will go down in the apple history of Minnesota as productive of the largest apple crop to date. How many bushels or barrels of apples went to waste, were a total loss, would be a huge guess, to which is to be added cost of production in cultivating, pruning, spraying, etc., a loss that might have been eliminated

Digitized by Google

by the practical application of two words, co-operation and distribution.

The sum of human wisdom has all been drawn from the past. Without a knowledge of what has gone before him, man gropes in the dark, and his efforts are merely experiments, lack stability and that degree of intelligence that comes of and by thoughtful experience.

Many apple growers now have a fair education derived from the past season's experience. With many it is an unpleasant memory or dream, according to how largely they were interested; but apple men have short memories for losses and long ones for gains—this is proverbial, otherwise they would be deserving of greater sympathy.

The crop of the past season (1911) was ample in its dimensions, and of good quality, but the growers have not learned how to calculate the consuming force of the non-producing public. My theory is that if you will feed the people good fruit, honestly packed, at a moderate cost, this country does not and will not for a long time, if ever, produce too many apples.

The bringing together of the producer and the consumer, or, in other words, the elimination of the middleman, more especially in cities, is a subject that has been studied and discussed, by individuals and by the co-operative fruit growers' associations, but it is proving a much more difficult task than appears on the surface.

One great impediment in the way of bringing producer and consumer together, and one not generally recognized, is the way in which city houses are heated. The majority of houses in cities have a furnace in the cellar. It is common experience that if one puts a barrel of potatoes or apples in the cellar, in a few days they are shrivelled up and are anything but inviting. The same is true of steam heated flats, and occupants of such places must necessarily purchase perishable products in very small quantities. However, by doing business on business principles, getting down to the full meaning of the word distribution with all it implies, by acting conservatively and co-operating wisely the great public may enjoy at a moderate and popular price that king of all fruits, "the apple". I am not an advocate of either low or high prices, but of fair prices—fair alike to both grower and consumer.

Co-operative fruit growers associations are not scarce by any means in Minnesota. They are sufficiently numerous to have led a number of practical fruit growers to think that the time is ripe for the formation of a federation of local associations. The time is near

Digitized by Google

at hand when some form of federation will come of necessity. By starting the good work now, while improved methods of production are becoming general, devising some means to establish a standard of grading and packing that will insure uniformity, developing a system of distribution and of market reporting, it should enable growers to dispose of their entire output without a recurrence of the past summer's experience.

The perishable nature of most of the varieties of apples grown commercially in Minnesota calls for a thorough knowledge of mar-

Cushman power spraycr running at 200 lbs. pressure in Mr. Simmons' orchard.

ket conditions when the fruit is ready to ship in order to place it where it is needed, when it is in perfect condition, and to realize honest values for the producer.

Fruit growing is becoming more highly specialized every year. Under these conditions co-operative effort is a business necessity, just as the consolidation of capital in other industries is necessary for its preservation.

The co-operative movements that have been organized among fruit growers have frequently failed. The social, the political or the altruistic motives have not been strong enough to hold a group of money-making growers together. Until recently the only successful co-operative efforts have been those which have been born of

Digitized by Google

desperate necessity. No other agency is so powerful in bringing about better methods of handling the industry, a greater prosperity, and a better community than a group of fruit growers who are successfully organized to protect and develop their interests.

In order to avoid many of the causes that have led to failure in co-operative associations, it is essential that strong, competent, aggressive men, capable of developing a progressive, constructive business policy, who can hold the interest and the confidence of the growers, men of tact, of sterling integrity and judgment in handling men, should have the management. A federation under any other kind of management cannot build on a solid foundation.

Our progress in horticulture has been almost marvelous, yet the future will be more marvelous because we have the measure of the past—the mistakes of the past, and the failures of the past—as a measure whereby we can become more proficient in the future.

Why Nut Culture is Important.

THE NORTHERN NUT GROWERS' ASSOCIATION.

Dr. Robert T. Morris says, "There are few acres of tillable land in the United States that will not yield $100 worth of nuts to the acre per year with less care than would be required for almost any other crop. Special acres, under special cultivation, and with special kinds of nuts are at present yielding in the neighborhood of a thousand dollars profit per year. At present the demand is so far in advance of the supply that we import many millions of dollars worth of nuts annually."

"It will be a great many years before over-production will interfere with profits."

"Almost anyone can have an income of a few thousand dollars a year from nut orchards, if he really cares to bring his initiative to bear upon the subject."

"There is no more promising work for the horticulturist than crossing hickories with walnuts and with each other. The hickories are to furnish a substantial part of the food supply of the world in the years to come."

"The stately pecan, the sturdy shagbark, can be made to replace, south and north, the millions of useless poplars, willows, and other bunches of leaves, which please the eye but render no valuable annual or final returns. The chief reason why this has not been done is because people have not thought about it."

Digitized by Google

The time has come to realize that nut growing is to be one of the great industries of the future and an important source of human food. An indication of this is the increase in importations of nuts and nut products, which, in the face of large increase in domestic production, amounts to millions every year. During the first eleven months of 1909 the importations of nuts and nut products were valued at $9,745,611; during the same period in 1910, $11,906,668; and in 1911, $13,717,104. We ought really to be exporting nuts.

Bread, butter and beefsteak are furnished by nuts, in a nutshell, in tablet form, in sealed individual packages, water-free, concentrated and uncontaminated. Yearly seeding, milking or butchering are not required.

A few bushels of chestnuts, hickories and walnuts from one's own trees would help solve the high cost of living.

The countries of the older eastern world set nut trees along their highways and sell the nuts for public revenue.

The pecan tree in the South has shown that grafted nut trees may be expected to fruit as early as the apple. Grafted nut trees of several varieties for the North can now be had from nurserymen. The want of them heretofore has been a difficulty, since seedling trees are very slow in fruiting and their nuts of uncertain character.

The purchase of seedling nut trees is not advised, but an interesting form of nut growing for the amateur is the planting in groves of large numbers of the finest nuts obtainable, the hickory, the black walnut, the Japanese heart nut, the Chinese walnut, Indian pecans, and the Japanese and Corean chestnuts, on the chance that these chestnuts will prove immune to the chestnut blight. They will all make beautiful trees, some of them will bear fine nuts and the timber will be very valuable. The pecan and the hickories may be top-worked interchangeably to improved varieties, the walnuts also may be grafted interchangeably with one another, and the chestnuts may be worked with our native species in the hope that immunity may be conferred on the scions. This is an important matter, for if some way of preserving our fine native chestnuts is not found they will soon be lost forever.

Every one who makes known a nut tree valuable for progagation does a service to the human race. Most such trees, far off in the fields and forests, are known to but few, who sometimes guard them with jealous secrecy. But there are nut trees even in our cities. For instance, there are a number of bearing Persian walnut

Digitized by Google

trees in New York city. All such trees should be known and studied. Thus may be preserved the race of many a valuable old tree that otherwise in a few years would be extinct. It is in this way that we must get our valuable varieties of nuts, in the same way that we have got our valuable varieties of other fruits. We have been unthinkingly contented with our generally small, thick-shelled, native, wild nuts or, for special occasions, large, thin-shelled, imported nuts. We have not stopped to think that the foreign nuts were once wild, small and thick-shelled, now improved by centuries of selection, and that the same can be done with our own wild nuts and, with modern facilities, much more quickly. It has already been done with the pecan with magnificent results.

Any one who knows of such trees is urged to send information and, if possible, nuts to some one of the officers of the association. If found worthy such nuts will be given the name of the person sending them.

Our native nuts are familiar enough, but it is not so well known that the Persian walnut, improperly called "English", the Japanese and Chinese walnuts, the almond and, it is believed, the pecan are, or can be, grown successfully by amateurs, and some of them commercially, in almost all the northern states and Canada. The best varieties have not yet been determined exactly, but that is only a question of time.

The fascination of nut growing is that many of the problems are still to be solved. We know that solutions are possible. Who will be the first to find them? Any one can hire somebody else to set out and maintain a fruit orchard by accepted methods with assured success, but if you want to grow fine nuts you must do at least some of the work yourself. You are almost sure to discover something new; and the satisfaction will be proportionately greater.

The Northern Nut Growers' Association is a co-operative institution for the general good. There are no salaried officers.

Any person is eligible to membership, with the approval of the committee on membership.

Annual membership is $2.00, life membership $20.00. Applications should be sent to the secretary, Dr. W. C. Deming, Westchester, N. Y. city.

Digitized by Google

PROGRAM 46th ANNUAL MEETING

Minnesota State Horticultural Society,
Held in Court House, Minneapolis, Minn.

December 3, 4, 5, 6, 1912.

PLEASE REGISTER.

Each person in attendance at the meeting is requested to sign the Register to be found on the table in the entrance hall.

Place of Meeting.

The annual meeting is to be held in Assembly Hall, on the ground floor of the Court House, in Minneapolis, with the fruit display in the open corridor directly between the 4th Street entrance and Assembly Hall. A commodious cloak room will be found conveniently located at the right of the fruit exhibit.

Fruit Exhibit.

Notwithstanding the light apple crop of the past season, a large fruit exhibit is assured. Competition in seedling and top-worked apples is open to include also western Wisconsin, northern Iowa, North and South Dakota and Manitoba. Be sure to bring something as a contribution to this fruit display. See list of premiums on last pages of this program.

Reduced Railroad Rates.

Each person attending either the Minnesota Forestry Association, the Bee-Keepers' Association or the Minnesota State Horticultural Society should secure a certificate from the railroad agent where the ticket is purchased (not prior to Nov. 29th or later than Dec. 5th) stating that fare has been paid from that point to Minneapolis.

This certificate properly signed at the meeting will enable the holder upon presentation, not later than Dec. 7, 1912, to the railroad agent in Minneapolis to purchase a return ticket for one-third the regular fare.

These certificates should all be handed to Secretary A. W. Latham, of the Horticultural Society, at the earliest opportunity after reaching Minneapolis, and they will be returned by the railroad agent to each holder in person on the afternoon of Dec. 6th (not before). The agent will be in attendance to sign these certificates on Dec. 6th **provided one hundred are secured.** A fee of 25 cents will be collected by him for each certificate turned.

HOTEL VENDOME IS SOCIETY HEADQUARTERS.

This hotel is conveniently located one-half block from the office of the society, at No. 19 South Fourth Street, midway between Nicollet and Hennepin Avenues. There is a cafe in the building, and a number of other good restaurants and hotels adjoin. Rates to members are $1.00 per room, one in room, or seventy-five cents per day each for two in a room. Room with bath, for one, $1.50, for two in the room, $1.25 each. Every room is provided with hot and cold water, electric lights, Tri-State telephone, etc.

A large room will be provided as headquarters of the society, to be used by the members for social purposes. The location of this room can be learned from the clerk at the hotel.

It would be well for members to address the hotel directly and make reservation for rooms as long a time beforehand as possible, to make sure of accommodations—always stating when you will arrive and depart.

PRUNING, GRAFTING, PACKING OF APPLES AND SPRAYING.

Each day of the annual meeting, from 1:00 to 2:00 o'clock p. m., the arts of top-grafting, packing of apples, propagation, spraying and pruning will be taught as regular class exercises in the audience room, and members can avail themselves of these opportunities to become proficient on these various arts. The demonstration in top-grafting will be led by Mr. R. M. Peterson, that in propagation by Mr. Arne Aamodt, the packing of fruit by Prof. A. R. Kohler, spraying by Prof. K. A. Kirkpatrick—all of these demonstrators being connected with the State Experiment Station at St. Anthony Park. Look for the signs in the audience room directing to these various exercises.

Discussion following each topic.

No persons are selected to open the discussion which may follow the presentation of each topic. Discussions "free for all," whether members or not. Ask questions or express opinions freely.

Extend Invitation.

Don't forget to **invite your friends** to this meeting. Neither forget the wife, who will enjoy an outing and meeting of this kind as well or better than you—nor the son or daughter, who is to follow you in this work.

For further information address the officers of the society. (See last page of this program.)

THOS. E. CASHMAN, Pres.,
Owatonna.

A. W. LATHAM, Sec'y.,
207 Kasota Block.
Minneapolis, Minn.

NOTICE:—A bell will be rung at the Fruit Exhibit five minutes before the exercises begin in the Audience Room.

A TEN MINUTE LIMIT ON PAPERS.

On account of the fullness of the program and to allow plenty of time for discussion, those presenting topics are requested to limit themselves to ten minutes, or 1,000 words, except as noted.

TUESDAY MORNING SESSION.
9:30 o'clock.

Every member attending should not fail to be in his seat promptly when this session opens.

Invocation....Rev. C. S. Harrison, York, Neb.
Song....Mr. Trafford N. Jayne, Minneapolis
President's Annual Greeting.....
.....Thos. E. Cashman, Owatonna

1. *The Mission of the Nurseryman.*
   C. S. Harrison, Delegate Neb. State Horticultural Society, York, Neb.
2. The Farm Home Beautiful.
   E. C. Hilborn, Hort. Lecturer, N. D. Farmers' Institute, Valley City, N. D.
3. Irrigation in the Strawberry Field.
   Wm. Saunders, Gardener, Robbinsdale.
4. Double Cropping the Orchard.
   G. W. Strand, Nurseryman, Taylor's Falls.
5. Birds the Natural Friends of the Horticulturist.
   Rev. Rett E. Olmstead, Naturalist, Excelsior.

Appointment of committees on credentials and award of premiums.

N. B.—Speak of Demonstrations.

Announce exercise at 1:30 p. m.

This session will **close promptly at 11:30 o'clock.**

All annual memberships expire on the first day of the annual meeting. Renew or become a member by paying the Secretary $1. Anyone may become a member by paying the annual fee of $1.00.

Membership fees will be paid to the Assistant Secretary in the Hallway.

NOTICE:—The annual meeting of the **Minnesota Fruit Association** will be held Wednesday evening at 8 o'clock, at a place to be announced.

TUESDAY AFTERNOON SESSION.

1:30 o'clock.

Discussions open to everybody.

The Question and Answer Exercise to occupy this half-hour will be on **"Winter Protection of Fruits,"** and led by J. M. Underwood, Pres. Jewell Nursery Co., Lake City.

2:00 o'clock.

President Cashman in the Chair.

Reception of Delegates.

Small Fruits and Other Things.

1. A Minnetonka Raspberry Field.
   Preston McCully, Fruit Grower, Maple Plain.
2. Growing Fancy Strawberries.
   Uri Miller, Berry Grower, Brookpark.
3. Strawberry Culture.
   F. O. Wildhagen, Del. N. E. Ia. Hort. Society, Waterloo, Ia.
4. The Everbearing Strawberry as a Commercial Proposition.
   Chas. F. Gardner, Nurseryman, Osage, Iowa.
5. The Cultivation of the Everbearing Strawberry.
   Geo. J. Kellogg, Retired Nurseryman, Lake Mills, Wis.
6. Grapes for the Home Garden.
   F. I. Harris, Fruit Grower, LaCrescent.

3:15 o'clock.

Minn. Garden Flower Association.

Mrs. H. B. Tillotson, President.

1. The Rose in History.
   Mrs. R. B. Boyington, Duluth.
2. The Shasta Daisy.
   C. C. Hunter, Minneapolis.
3. Two Minute Talks on New or Uncommon Flowers as Grown by Members of the Minnesota Garden Flower Society.

Question Box.

The program will close with a stereopticon talk on **"Ornamenting Home Grounds,"** by Phelps Wyman, Landscape Architect, Minneapolis.

Are you a member of the Plant Breeders' Auxiliary? If you are growing seedlings and a member of the Horticultural Society, you should join it at once. No expense. Consult the secretary.

WEDNESDAY FORENOON SESSION.

9:00 o'clock.

Discuss each topic freely.

A half hour question and answer exercise on **"The Farmer's Orchard,"** led by Henry Husser, a successful farmer, of Minneiska.

9:30 o'clock.

Orchard Fruits.

Platform Demonstration in Pruning Orchard Trees, by Prof. K. A. Kirkpatrick, Horticulturist, Extension Division, State University.

1. The Horticultural Needs of State as Viewed from Institute Platform.
   A. D. Wilson, Supt. Farmers' Institutes, St. Paul.
7. The Minnesota Fruit Association.
   K. A. Kirkpatrick, its first manager.
3. Cedar Rust in the Orchard.
   Fred O. True, Mankato.
4. Crown Grafting Apple Trees in the Nursery Row.
   E. A. Smith, Vice Pres. Jewell Nursery Co., Lake City.
5. Growing an Orchard in the Red River Valley.
   O. A. Th. Solem, Nurseryman, Halstad.
2. Diseases of the Oak in Minnesota.
   Prof. E. M. Freeman, Prof. Botany and Pathology, State Agricultural College, St. Paul.
8. Scope and Value of State Inspection.
   Prof. F. L. Washburn, State Inspector of Nurseries.
9. Ginseng Growing No Pipe Dream.
   A. Brackett, Fruit Grower, Excelsior.

You can become a life member of the State Horticultural Society by payment of $10.00, in two annual payments of $5.00 each if you prefer. This will entitle you to a file of our bound reports, a library in itself.

WEDNESDAY AFTERNOON SESSION.

1:30 o'clock.

Secure your banquet ticket now.

A half hour "Question and Answer Exercise" on **"The Windbreak and the Orchard,"** led by E. G. Cheyney, Professor of Forestry, State University.

2:00 o'clock.

President Cashman in the Chair.

The Establishment of Orchards on the Principle of Natural Selection to Obtain Inherent Qualities in the Propagation of Trees.
Geo. T. Powell, Pres. Agri. Expert Association, Ghent, N. Y. 30 minutes. Ask questions of the speaker.

2:30 o'clock.

Minnesota State Forestry Association.

Vice-President Prof. T. L. Haecker in the Chair.

President's Greeting.
Prof. T. L. Haecker, State Agri. College, St. Paul.

1. The Origin of the Hot Winds and How to Prevent Them.
   J. W. Maher, Devil's Lake, N. D.
2. The Forest Home.
   Mrs. Gilman, Minneapolis.
3. The Hardwood Forests of Southern Minnesota.
   P. C. Records, Ranger, State Forest Service.
4. The Forests and the Big Game.
   W. T. Cox, State Forester, St. Paul.
5. The Need for State Forests.
   Mrs. C. J. Backus, St. Paul.
6. The Work of the Forest Ranger.
   Wm. Kilby, Ranger, State Forest Service.
7. Why Minnesota Forests Should Not Be Reduced.
   G. E. Marshall, Supervisor, Minnesota Natural Forests.
8. Our Second Industry and Its Future.
   Z. D. Scott, Pres. State Forestry Board.

4:15 o'clock.

The afternoon program to conclude with a lantern lecture on the subject of **"Forests and Forest Industries,"** by Prof. E. G. Cheyney. Stay and enjoy this.

The Forestry Association will also hold a **meeting on Wednesday evening,** beginning at 8:00 o'clock.

THURSDAY FORENOON SESSION.

9:00 o'clock.

Have you a Banquet Ticket?

A thirty-minute "Question and Answer" exercise on **"The Top-Worked Orchard,"** led by O. W. Moore, Spring Valley.

9:30 o'clock.

President Cashman in the Chair.

1. Report of Committee on Fruit List.
   J. P. Andrews, G. W. Strand, T. E. Cashman.
   Adoption of Fruit List.

Digitized by Google

Annual Reports.

Report of Executive Board, Wyman Elliot, Chairman, Minneapolis.
Report of Secretary, A. W. Latham.
Report of Treasurer, Geo. W. Strand, Taylors Falls.

On account of the very full program the annual reports of the vice-presidents and superintendents of Trial Stations **will be filed with the secretary for publication without reading.** (See list on page 16.)

Reports of Auxiliary Societies, 1911.

Two-Minute Reports

Minnesota State Bee-Keepers' Society, Minnesota Garden Flower Society, Southern Minnesota Horticultural Society, North Dakota Horticultural Society, Kandiyohi County Horticultural Society, Red River Valley Horticultural Society, Minnesota State Forestry Association, Lac qui Parle County Horticultural Society, Northeastern Minnesota Horticultural Society, State Florists' Society.

10:45 o'clock.

"Some Problems in the Extension of Apple Orchards. Is Production Going to Overtake Future Demand?" Geo. T. Powell, Horticultural Expert, Ghent, N. Y. 30 minutes.

Demonstration in Top-Working Orchard Trees. Prof. K. A. Kirkpatrick, Extension Division, State University.

1. Increasing Hardiness in Orchard Trees.
   Henry Dunsmore, Farmer-Orchardist, Olivia.
2. Failures and Successes in Orcharding and Why.
   H. J. Ludlow, Farmer-Orchardist, Worthington.
3. Dewberries for the Farm Garden.
   W. J. Hopkins, Small Fruit Grower, Station F, Minneapolis.

THURSDAY AFTENOOON SESSION.

1:30 o'clock.

Discuss these subjects.

"Fighting Insects in the Garden and Orchard," will be the subject of the half hour "Question and Answer Exercise," led by Prof. F. L. Washburn, State Entomologist.

2:00 o'clock.

President Cashman in the Chair.

1. New and Old Plums in 1912.
   Dewain Cook, Gardener and Fruit Grower, Jeffers.
2. Late Developments in the Plum.
   M. Penning, Retired Farmer, New Ulm.
3. Plums for the Northwest.
   Col. Freeman Thorp, Artist and Agri. Experimenter, Hubert.
4. Judging Fruit.
   A. R. Kohler, Asst. Horticulturist, State Agricultural College, St. Paul.
5. The Bee a Benefit to the Horticulturist.
   E. L. Hofman, Bee-Keeper, Janesville.
6. The Causes of Failure in Fruit Growing.
   Gust Johnson, Fruit Grower, Minneapolis.

3:15 o'clock.

Annual Election of Officers.

3:45 o'clock.

Woman's Auxiliary.

Miss Emma V. White, President, in the Chair.

1. From the City to the Farm.
   Mrs. E. E. Lundgren, Cannon Falls.
2. Demonstration Work in Horticulture for Public Schools.
   Miss Elizabeth H. Foss, Teacher Mpls. Public Schools.
3. A Plea for the Birds from the Fruit Grower's Point of View.
   S. H. Drum, Retired Farmer, Owatonna.
4. A Message to the Women of the Rural Districts.
   Mrs. E. H. Loyhed, Faribault. 20 min.
5. Public Parks in Prairie Towns.
   L. R. Moyer, Montevideo.

5:00 o'clock.

"Mimicry of Insects," a Lantern Talk by Prof. F. L. Washburn, State Entomologist.

At 6:00 o'clock we go in a body to the annual society banquet. Service at 6:30 o'clock. Don't stay away!

FRIDAY FORENOON SESSION.

All Discussions Open to Every One.

9:00 o'clock.

A thirty-minute "Question and Answer exercise" on the general subject of **"The Market Garden,"** to be led by F. M. Libby, Market Gardener, Minneapolis.

9:30 o'clock.

President in the Chair.

Vegetables, Etc.

1. Marketing Garden Produce. A Talk.
   E. O. Ballard, Produce Merchant, Minneapolis.
2. The Canning of Truck Crops. (Recital of a successful experiment with an outfit costing $150, good for 1,000 cans a day.)
   Prof. A. T. Erwin, Del. Ia. Hort. Society, Ames, Iowa.

"Orchard Cultural Methods. Pruning with Reference to Control of Insects and Yield of Fruit." Geo. T. Powell, Ghent, N. Y. 30 min.

10:30 o'clock.

Plant Breeders' Auxiliary.

(Wear the Button.)

Clarence Wedge, President, in the Chair.

1. The Plant Breeders' Auxiliary in 1912.
   J. M. Underwood, Secy., Lake City.
2. The State Fruit-Breeding Farm for 1911.
   Chas. Haralson, Supt., Excelsior.
3. Report of Committee on Examination of of the Minnesota State Fruit-Breeding Farm.
   Dr. C. H. Mayo, Rochester, J. M. Underwood, Lake City, Comittee.
4. Scientific Principles Underlying the Art of Fruit Breeding.
   Dean A. F. Woods, State Agri. College, St. Paul.
5. Address.
   Prof. N. E. Hansen, Horticulturist and Fruit Breeder, Brookings, S. D.
6. What is Hardiness?
   Prof. M. J. Dorsey, Expert in Plant Breeding, State Agricultural College, St. Paul.

Election of Officers, Plant Breeders' Auxiliary

Are there any good seedling apples, etc., in your neighborhood? Get them and the owner of the trees to the annual meeting. Do your neighbors a favor by urging them to attend.

FRIDAY AFTERNOON.

1:30 o'clock.

The "Question and Answer" half hour will be occupied with this subject, **"Increasing and Maintaining Fertility,"** led by Harry Snyder, Mpls., late Professor of Chemistry, State Agri. College.

Digitized by Google

2:00 o'clock.

President in the Chair.

Pruning, Spraying and Marketing.

1. Apple Conditions in the United States.
   Harold Simmons, Fruit Grower, Howard Lake.

Cultivation of the Orchard, with or without Cover Crops. Three 5 minute papers.

1. a. Jas. K. Dixon, N. St. Paul.
   b. Rev. F. Willis, Excelsior.
   c. John Osborn, Dassel.
2. Lessons from a Spraying Experience.
   D. E. Bingham, Pres. Wis. State Hort. Society, Sturgeon Bay, Wis.
3. Spraying Under Minnesota Conditions.
   E. C. Stakman, Assistant Pathologist, State Agricultural Colelge, St. Paul.
4. Packing Apples.
   W. M. McDonald, Manager, Excelsior Fruit Growers' Association.

3:30 o'clock.

Two-minute speeches by members.

4:00 o'clock.

Closing remarks by the President.
Song.
Adjournment.

CHINKING.

The following subjects will be called up at any point in the program where opportunity offers. Experience shows that there will be such openings, when we may expect to hear from these friends. But to be sure of getting this you must be on hand both early and late.

1. The Mole as a Garden Accessory.
   Dr. D. J. Kenney, Minneapolis.
2. Pedigreed Nursery Stock.
   Prof. C. B. Waldron, Professor of Horticulture, Fargo, N. D.
3. Observations in the Orchards of the the Northwest.
   J. F. Harrison, Farmer-Orchardist, Excelsior.
4. The Farmer's Apple Orchard.
   Fred Cramer, Farmer, Mapleton.
5. Red Bark Native Rose as a Hedge Plant.
   F. E. Schotzko, Springfield.
6. Paper winning first prize in 1913, Gideon Memorial Contest.
7. A Top-Working and Seedling Experience.
   John Bisbee, Farmer and Orchard Experimenter, Madella.

PREMIUM LIST, ANNUAL MEETING, 1912.

Thos. Redpath, Supt. Fruit Room.
Frank I. Harris, Assistant.
Geo. W. Strand, Entry Clerk.

All entries must be made with the Secretary at least **one week before** the date of the annual meeting, and blanks may be secured of the Secretary for this purpose.

All exhibits **must be in place by 9 o'clock** A. M. of the first day of the meeting to be entitled to compete for premiums.

Exhibitors competing must be members of this society and growers of the articles exhibited.

The rules governing the horticultural department of the Minnesota State Fair will be applied except where they conflict with this list.

SEEDLING APPLES.

Five specimens (not less than 2½ inches in diameter) must be furnished of each variety exhibited.

Entries of seedling apples can be made only by owner of the original tree or his sole authorized agent. Competition is open to all except on such varieties as are being propagated for sale by some person other than the originator.

Competition in seedling apples is open also to the western half of Wisconsin, the northern third of Iowa, and all of North Dakota, South Dakota and Manitoba.

Premiums will be divided pro rata among all entries commended by the judges according to the comparative merit of each as a commercial fruit.

Before payment of premiums awarded on seedling apples, a history and description of the tree and its fruit, with samples of one and two year old wood from the tree, may be required.

N. B. The judges will at their discretion change entries of seedling apples from either class to the other.

EARLY WINTER SEEDLING—The fruit shown must not have been kept in cold storage.

Premium $30.00, to be divided pro rata.

LATE WINTER SEEDLING—Same conditions as for early winter seedlings except that if found necessary the fruit shown may be retained and final decision reserved until later in the winter.

Premium $50.00, to be divided pro rata.

In each of the above two classes the varieties receiving the three highest awards will be designated as having received the first, second and third premium respectively.

Grapes.

Each variety shown	.75	.50	.25	...

APPLES (not including crabs).

Each variety (may or may not have been in cold storage) included in the 1912 fruit list of the society, or in the 1912 premium list of the Minnesota State Fair.....	.50	.40	.30	...
Collection, not to exceed ten nor less than six varieties ....$20.00, to be divided pro rata				

Pecks of Apples.

Peck of any variety of apples, the fruit exhibited to be at the disposal of the society. An exhibitor may enter a peck each of as many different kinds as he pleases. $25.00, to be divided pro rata.

Top-Worked Apples.

Collection of named varieties grown on scions top-grafted on other trees. Accompanying the name of each variety shown on the same label (to be furnished by the management), must be noted the name of the variety on which it is top-worked. $25.00, to be divided pro rata.

Competition in "top-worked apples" is open to same territory as for seedling apples.

BOXES OF APPLES.

Only one variety (not less than 2¾ in. in diameter) can be shown in a box. Bushel boxes of the standard size must be used. Awards will be based on the quality of the fruit, packing, etc.

SINGLE BOX of any variety of apples, including seedlings. $25.00, to be divided pro rata.

In addition to the above, the best box of apples will receive a **Special Premium of Five Dollars.**

Sweepstakes Exhibit of Apples in Boxes— Exhibitors in this class must show in lots of five boxes or some multiple thereof, that is, 5, 10, 15 or 20 boxes. Boxes of apples for this exhibit will be held in cold storage and delivered at the place of meeting without cost to the exhibitors, and a sum of money amounting to seventy-five cents for each box of apples shown will be divided among the exhibitors pro rata according to the merit and size of the exhibit. For instance, if there are 100 boxes shown altogether in this exhibit, $75.00 will be divided pro rata among the exhibitors. If 150 boxes are shown, $112.50 will be divided pro rata. The exhibitors of this fruit will retain the fruit and may sell it for delivery at the close of the exhibition.

NUTS.

Each variety of edible nuts, one quart	$1.00	.75	.50	.25

Digitized by Google

GARDEN HELPS

Conducted by Minnesota Garden Flower Society

Edited by Mrs. E. W. Gould, 2644 Humboldt Avenue So., Minneapolis

The holly was originally called "Christ's thorn" by the early Christians, then "The holy tree," and finally "holly." This is one of the most beautiful greens for Christmas decoration and best expresses the religious significance of the day. Mistletoe is just as old and just as peculiar to the holiday season, but it is a pagan symbol. A few sprays of this are all that one would wish in decorating.

The finest holly is shipped in cardboard boxes and has two or three times as many berries as the ordinary grade that has been jammed into barrels for shipment.

There are also two grades of ground pine, the universal material for roping. The first grade is a good bright green, while the second is dull and yellowish. Be sure to get the best.

The prettiest red-berried vine for Christmas decoration is our native bitter-sweet, which can be gathered in October while the leaves are still on and hung in the cellar until wanted. Though the leaves will be shriveled they will enhance the beauty of the bright berries. Just before using dip the berries for a moment into boiling water, which will cause them to plump up until they are as large as when picked.

No green vine is as beautiful for general decoration at this time as the southern smilax, which comes in sprays from six to forty feet long, and no vine is as easily put up, or as graceful, or lasts as long. This comes by the crate and should be ordered from your local florist early in December, as otherwise you might not be able to get it when the Christmas rush is on.

Galax leaves, both green and brown, can now be had all the year from the florists. These will keep a year in a cool room if the stems are kept in water and clipped a little occasionally. If you wish an unusual table decoration for Christmas use these leaves. Afterwards they can be put in a cool place and so be used many times. They also make good wreaths and are not as hard upon the fingers as holly.

Of course the cheapest decoration is branches of native evergreens gathered by oneself, but few of us have this chance, or would care to cut down our own trees if we had them.

The little dwarf pines from Japan make artistic centerpieces as do the araucarias, or small potted evergreens, tied with gay little scarlet bows. These can be kept growing for years if put out in a shady spot in the garden for the summer and given new earth. They will grow a new set of branches each year.

Home grown flowers have a personal touch that the purchased article lacks for a Christmas gift. The three easiest flowers to grow are Chinese sacred lilies in bowls of water, Roman hyacinths in sand, and Dutch hyacinths in tall glasses of water. The first two will bloom in forty days from planting, but the bulbs of all three can be ordered as late as December first, for even if the plants are not in bloom at Christmas time so much the better, as the recipient of this gift will have the pleasure of watching the development of the flowers.

Some gifts that a garden enthusiast would appreciate for Christmas: garden tools, garden basket containing trowels and shears; flat basket for flower gathering, seeds of your choicest flowers, bulbs, subscription to a good garden magazine, pruning shears, garden note book.

A large umbrella such as is used on delivery wagons with a long pointed handle that can be thrust into the ground, under which one can work in comfort the sunniest day.

Cabinet for flower seeds, express wagon that can be used in the garden —child's size; flower holders for table decorations, bundle of canes, labels and raffia for staking, marking and tying next year's flowers.

Small rubber rug on which to kneel when transplanting, garden gloves.

Garden apron made of denim or other heavy cloth with plenty of pockets of all sizes that will hold seeds, tools, string, etc.

Year's membership in the Garden Flower and Horticultural Society.

Digitized by Google

SECRETARY'S CORNER

OUR REPORTS APPRECIATED.—"Apart from the Am. Pom. Society Reports, the Minn. Society Reports are the only annuals that I am incorporating into my pomological library. On account of your contest with climate, the Minnesota Reports contain more information about growing and about varieties of apples than those of any other society."—A. A. Schenck.

FRUIT EXHIBIT AT THE LAND SHOW.—A magnificent display of Minnesota apples is being made at the Land Show operating in Minneapolis, commencing Nov. 12th, and continuing for ten days. This exhibit is in charge of Thos. Redpath, assisted by Wm. McDonald, of Excelsior. They have, we understand, 280 half boxes of apples, mainly Wealthy, for this exhibit, certainly a wonderful showing for Minnesota and a great advertisement of the orcharding possibilities of our state.

REMITTING FOR MEMBERSHIP FEE.—In making remittance for the annual fee for 1913, please note that from our long experience it is practically entirely safe to send a $1.00 bill in a letter in payment of this fee Postal orders and express orders are all right of course, involving only a slight expense. If you send a check, however, make the check out for $1.10, as most of the banks in the state outside of the Twin Cities and Duluth are charging that amount for collection.

DELEGATE, NORTHEAST IOWA HORTICULTURAL SOCIETY.—Mr. F. O. Wildhagen, of Waterloo, Iowa, is to represent the Northeast Iowa Horticultural Society at our annual meeting. Mr. Wildhagen has had a large experience in growing strawberries and is to give the meeting the benefit of it in a paper on the general subject of "Strawberry Culture." He will be found upon the program for Tuesday afternoon, and every grower of small fruits in the society should be at hand to hear this paper and others on similar topics.

LIFE MEMBERSHIPS AS PREMIUMS.—Mr. Geo. W. Harris, of McHugh, now for the second time has sent in a life membership to the society given as a premium for the best general collection of fruit shown at their county fair. It would seem that an offer of this kind would be of as much value in enlisting the interest of exhibitors as ordinary money premiums. It is certainly of large value to the Horticultural Society to have a step of this kind inaugurated, and we hope other county fair associations will see fit to follow in the way that Mr. Harris has so thoughtfully taken.

MICE A MENACE.—Reports of serious damage from mice to Minnesota orchards are already coming into the office, notwithstanding it is so early in the season. Do not fail to mound up each tree with fresh earth at least a foot high above the surface of the ground with a good slope to the mound, and pat it down smooth with the back of the spade. Experience shows that no mouse will climb this slope. If mice are very plentiful it would be well to poison them with strychnine and cornmeal, put on a chip or in a tin can set on its side. It should be covered in such a way as to exclude the rain and snow and yet permit mice to enter. Their numbers can be readily thinned out in this way.

Digitized by Google

Minnesota State Horticultural Society.

DECEMBER 5-8, 1911.

Tuesday Morning Session.

The forty-fifth annual meeting of the Minnesota State Horticultural Society was called to order at 9:30 o'clock, in the First Unitarian Church, Minneapolis, December 5th, 1911, by the president, Hon. Thomas E. Cashman, of Owatonna.

The invocation was made by Rev. R. E. Olmstead, of Excelsior.

Following the invocation Mr. Trafford N. Jayne delighted the audience with a vocal solo.

A few words of greeting were then given the audience by the president, Mr. Cashman, as follows:

I am pleased and happy to see so many present this morning, particularly happy in seeing so many of the old familiar faces. One year has elapsed since we met here in annual convention, but it seems only as though it were yesterday that we adjourned the meeting and bade each other good-by to meet again in a year from that time. Providence has been very kind to us during the past season. Our lives have been spared, we have enjoyed abundant prosperity, for all of which we should be truly thankful.

I find before me an overflowing program, filled with topics of great moment to horticulturists and agriculturists in this state, and I am pleased to note that each one of these subjects will be handled by men of wide experience, and men who have thorough knowledge of what they are going to discuss. I am going to throw precedents to the winds by not delivering an address, which will be pleasing news to those who have heard me before. I am afraid if I should attempt to impose upon you at this time an address you would feel something like the Irishman who was given a long sentence by the court. Contrary to the usual custom, the court did not ask the Irishman before sentence was pronounced if he had anything to say, but he merely sentenced him to fifteen years at hard labor, and afterwards he asked him if he had anything to say. Pat said: "Oy have nothing to say, except that I think your honor is mighty liberal with other people's time". (Laughter.)

Owing to the fullness of the program and in order to allow plenty of discussion for each subject, those presenting topics are requested to confine themselves to ten minutes. This will give us opportunity to complete the program in the allotted time, and give all an equal chance. Secretary Latham has prepared a splendid program for us, and I notice he has given us some of the best things at the beginning. I find at the head of the list that our good friend,

Digitized by Google

George J. Kellogg, is going to speak to us on the subject of everbearing strawberries. I am going to ask Mr. Kellogg to come forward now and speak to us on that subject. (Applause.)

Mr. George J. Kellogg, of Lake Mills, Wis., then read a paper on the subject of "Evolution of the Everbearing Strawberry". (See index.)

Discussion.

The President: If there is no further discussion upon this subject, we will now take up the next one on the program, "Sorting and Packing Apples", by Mr. C. E. Snyder, of Preston, Minn. Mr. Snyder, who wrote the paper, is not present himself, but his son, Paul, is present and will read the paper. We would like to have Mr. Snyder come forward and read the paper. Mr. Snyder is one of the coming young nurserymen of southeastern Minnesota". (Applause.) (See index.)

I want to congratulate Mr. Snyder on his paper. Our people are not yet thoroughly up on this subject, and the information that is given here is just the advice that is sought for.

I see Mr. Reel is present, and I am going to ask him to come forward and read his paper on the subject of top-working apples. (Applause.)

Mr. E. G. E. Reel, of Excelsior, then read a paper describing "My Top-Worked Orchard". (See index.)

Discusssion.

Mr. Smith always has something good for us, and I am sure he is not going to disappoint us at this time when he speaks on the subject of "Timely Horticultural Notes". (Applause.)

"Timely Horticultural Notes" was then discussed in a paper by Mr. E. A. Smith, vice president of the Jewell Nursery Co., Lake City. (See index.)

Discusssion.

The President: We now come to another interesting subject, and that is "Incidents and Anecdotes Developing Irrigation with Lake Muck," and that topic will be handled by Mr. C. R. Sandvig, of Belgrade. Mr. Sandvig has been allowed fifteen minutes for this topic. Mr. Sandvig is the gentleman who entertained us so royally a year ago, and we are glad that he is here again with us and expect he will entertain us as well as he did a year ago. (Applause.) (See index.)

The President: I am informed that our Farmers' Institute lecturer cannot be with us next Friday morning, when his paper is scheduled to appear on the program, and for that reason I am going to ask Mr. Brackett to give his paper now on the subject of "No Hardy Trees without Hardy Roots".

Mr. A. Brackett, of Excelsior, then read a paper on the subject, "No Hardy Trees without Hardy Roots". (See index.)

Discussion.

On motion of Mr. Sahler, the meeting adjourned.

Digitized by Google

Tuesday Afternoon Session.

The preliminary "question and answer" exercise was opened at 1:30 on the subject of "Small Fruit Growing," and was led by Mr. E. B. Miller, of Bloomington. (See index.)

The regular session was called to order by President Cashman at 2:00 o'clock.

The President: The first item we will take up this afternoon is the report of the committee on credentials.

The commitee on credentials reported the following delegates present and entitled to seats in the convention:

Col. W. A. Burnap, Northeastern Iowa Society.

Mr. A. J. Glidden, South Dakota Horticultural Society.

Dr. H. M. Speechley, Manitoba Horticultural Society.

Mr. M. L. Hanchett, Wisconsin Horticultural Society.

The President: We are glad to see Col. W. A. Burnap from the Northeastern Iowa Society with us. Col. Burnap was with us a number of years ago, and I am sure we all enjoy having him with us at this time, and we now want to hear a few words from him. I want to introduce to you Col. W. A. Burnap. (Applause.)

Col. Burnap: Mr. President, Ladies and Gentlemen, I know you don't want to hear any long talk from me. I only want to say that I commenced to set trees in Northern Iowa in 1857, and ever since that time I have been a horticultural crank of the deepest and darkest dye. I am very glad to be here with you Minnesota fellows where I have lots of good company and feel perfectly at home. I have had horticultural grief in all its varieties, and, on the other hand, I have had some success. You will probably have found out something of both before we get through this meeting. (Applause.)

The President: I am now going to call on Mr. A. J. Glidden, the delegate from South Dakota. (Applause.)

Mr. A. J. Glidden: I do not think I can interest this audience by anything I have to say. I have been interested in horticultural work in our state ever since I have been there. I went to the state in 1882, and the first thing I planted when I got there was tree seed, walnut and other tree seed. I am very glad to be here and expect to receive a great deal more than I can return. I will try to do my part during this meeting as far as I can. (Applause.)

The President: We heard from Dr. Speechley this morning, but we would be pleased to hear from him again. (Applause.)

Dr. H. M. Speechley: I do not feel like speaking again at this time. I was here two years ago, and I come at this time to bring you greeting from the Manitoba Horticultural and Forestry Association. I hope you will not regard it out of place if I refer for a moment to Professor Green. Professor Green, to my mind, was one of the best men I ever had the pleasure of meeting. We had him at our annual meeting and received much benefit from his presence, and it made us sad when we heard that he had passed away. I want to congratulate you upon having had the leadership of Professor Green for so many years, and we know his influence

Digitized by Google

was great, not only upon those who were his contemporaries, but on all those who came under his influence. I thank you for this opportunity, Mr. President. (Applause.)

The President: We have another delegate with us, Mr. Hanchett, of Wisconsin, and we want to hear a few words from him. (Applause.)

Mr. F. L. Hanchett (Wisconsin): I came up here for the sole purpose of spying on the gopher. I always feel that as a matter of business for us people in Wisconsin we must keep watch of what our neighbors are doing. I can be with you only this afternoon, but still it is worth a trip to be with you even a half day. I am very much interested in the apple show you have down here, and I am glad you are doing so well in horticultural lines. I thank you for this opportunity of addressing you. (Applause.)

The President: I am sure we are all sorry that the gentleman from Wisconsin cannot stay with us longer, but we hope he will come again. We are pleased to have these delegates with us and hope to hear from them often during the course of the meeting.

The first number on this afternoon's program is the subject of the strawberry field, which will be discussed by Preston McCulley.

Preston McCulley, of Maple Plain, then read a paper describing "The Strawberry Field". (See index.)

Discussion.

The President: I have just learned that Professor Chas. W. Hendricks will be obliged to leave this afternoon, and we will give him an opportunity to give us his paper on the subject of "Harvesting and Storing Corn".

The proper method of "Harvesting and Storing Seed Corn for Both Field and Garden Uses" was then discussed in a paper by Chas. W. Hendricks, director of Agricultural School, Spring Valley.

The President: Mr. Hendricks is a sample of eighty-five young men teaching agriculture in the schools of Minnesota. This was made possible by the act passed in 1909. I want to congratulate the schools and the people of Spring Valley for being able to have such a competent man as Mr. Hendricks give them his service.

Next on the program is a paper on the subject of "My Way with Strawberries" by Mr. F. L. Marsh, of Champlin. Mr. Marsh is not present, but some one is here who will read his paper for him. (See index.)

The President: I regret that time will not permit us to discuss this paper. I have learned that Mr. Dewain Cook will not be with us to read his paper, that is, at the time when it is scheduled to appear on the program, and I will therefore ask him to come forward now and discuss the subject of hybrid plums.

"Hybrid Plums and What We May Expect from Them" was then presented in a paper by Mr. Dewain Cook, Jeffers. (See index.)

Discussion.

The President: The next on the program is the Beta grape, which will be discussed by Mr. Wm. Pfaender.

Digitized by Google

Mr. Wm. Pfaender, Jr., of New Ulm, then read a paper telling of "The Beta Grape and Its Origin". (See index.)

Discussion.

The President: I will now call on Professor John C. Stewart, who will give us a paper on tile drainage of the orchard.

"Tile Drainage in the Orchard" was then discusssed in a paper by Professor John Stewart, Professor of Engineering, State Agricultural College, St. Anthony Park. (See index.)

The President: We will now hear from a melon expert, who will tell us how to grow melons, Mr. Swennes.

Mr. Knute Swennes, Minnesota, then told in a paper, "How a Farmer Raises Melons". (See index.)

Discussion.

The President: The next subject is by Mr. Oscar Seamens, of Excelsior, on the subject of "The Raspberry Field". Mr. Seamens is present but has asked Mr. Robert Wright, of Excelsior, to read his paper. (See index.)

The President: The next paper on the program which will be read is by Mr. E. W. Reed, who is associated with Holm & Olson, florists, St. Paul. We are very glad to have Mr. Reed with us, and we expect he will give us some very valuable information.

"Minnesota as a Fruit State and Its Possibilities as Compared with Other States", was treated in a paper presented by Mr. E. W. Reed, of St. Paul.

The President: I want to congratulate the society upon having this very valuable paper presented by Mr. Reed.

On motion of Mr. Wedge the meeting adjourned.

Wednesday Morning Session.

The preliminary question and answer exercise, on the subject of "Growing Flowers", was conducted by Mrs. H. B. Tillotson, of Minneapolis, beginning at 9:00 o'clock.

The regular session of the society was called to order at 9:30 o'clock by President Cashman.

The President: Mrs. Tillotson has exceeded the time limit, but I want to congratulate her on the profitable time we have spent here.

Professor Moore, of Wisconsin, is here, and we would like to have him come forward, and to show how he is appreciated where he comes from I want to read a letter from Secretary Cranefield of the Wisconsin Horticultural Society.

President Cashman then read a letter from Secretary Cranefield, introducing Professor Moore and speaking also in appreciation of his work.

Prof. Moore (Wis.): Members of the Minnesota Horticultural Society, I assure you that it gives me great pleasure to attend your meeting as a representative from our own state society. I have been in Minnesota before, but only for a short time, and I have never had the privilege of meeting very many of your members.

Digitized by Google

The state horticultural societies of these middle western states are societies of which the states should be proud. I think these societies are doing more for the upbuilding of horticulture in their respective states than are the societies of any other states in the Union. You may not have been holding any more meetings, but in your meetings and in your work outside of the meetings you are getting at the points which are of vital interest, and it does not center entirely along the line of simply talking. Talk is good if it is along the right line, but it does not accomplish very much unless there is some action connected with it. In addition to talking in our horticultural society meeting we are also doing things. So I say that these states have a right to be proud of their horticultural societies. As a representative of the Wisconsin society I extend the greetings of the horticultural society of that state, and I assure you that we shall try to profit by your meetings. I was told that when I came back to Wisconsin I should give a report of the session held here at our annual meeting, so I shall be glad to pick out the profitable and educational features of your meeting here and convey them to our own society, which meets next month at Madison. I thank you. (Applause.)

The President: I think we can assure Secretary Cranefield that Professor Moore will more than earn his board while he is with us.

We will now take up the regular program of the morning, and the first number on the program is on the subject of outdoor storage. Mr. F. L. Marsh, of Champlin, who is a practical architect and builder, will tell us all about this storage cellar.

"An Outdoor Storage Cellar" was then described in a paper read by Mr. F. L. Marsh, of Champlin. (See index.)

Discussion.

The President: We now come to another very important subject, and that relates to the packing and marketing of apples. The general subject this morning is orchard fruits, and this particular topic I am sure all apple growers are interested in.

The subject of "Packing and Marketing" was then discussed in a paper presented by Mr. A. R. Kohler, Assistant Horticulturist, Minnesota Agricultural College, St. Anthony Park. (See index.)

Discussion.

A resolution was then submitted by Mr. Smith condemning the wrong labeling of apples. (This resolution failed to reach me.—Secretary.)

On motion of Mr. Sahler the resolution was unanimously adopted.

The President: The next number on the program is a paper by Professor Moore, Professor of Horticulture in the Wisconsin State Agricultural College. Mr. Moore has been assigned fifteen minutes for presenting his topic, and I am sure we shall be very well entertained and instructed. (Applause.)

Professor James G. Moore, of Madison, Wis., then dwelt upon "The Prospects of Commercial Apple Growing in the Middle West" in a paper which he presented. (See index.)

Digitized by Google

Discussion.

The President: These are very valuable and important suggestions, and I think we certainly should act upon them. I am sorry that we must cut the discussion off here, but we have already encroached upon the time of the Minnesota Garden Flower Society, and we must give the balance of the morning to them. However, I do not think this matter should be allowed to rest, but later in the meeting it might be taken up again and forced to some definite conclusion.

I now turn the meeting over to the Minnesota Garden Flower Society, of which Mrs. H. A. Boardman is president.

Minnesota Garden Flower Society.

The meeting of this society was called to order by its president, Mrs. H. A. Boardman, at 11:00 o'clock.

The President: We hated very much to lose our former name, but it was a little misleading, and some members thought if they could not grow roses they could not be members of the society. That is one reason why we changed the name from the Minnesota Rose Society to the Minnesota Garden Flower Society. This morning we will have as our first number a paper by Miss Ellison, who claims to be an amateur flower grower, but she is an amateur in name only, as she can give us just as much information as though she were called a professional. (Applause.)

"My Summer in a Garden" was then described by Miss Sabra M. Ellison, of Minneapolis. (See index.)

Discussion.

The President: We would like to continue this interesting discussion longer, but we must take up our next number. Perhaps the question we have discussed will in part be answered by the next paper to be presented by Mr. Brown, of Excelsior, on the subject of three hardy perennials. Mr. Brown is too well known to need an introduction to this audience.

Mr. J. P. Brown, of Excelsior, in a paper he presented then discussed "Three Hardy Perennials". (See index.)

Discussion.

The President: If there is no more discussion upon this subject we will take up the next paper, which is a topic on ornamental planting for winter effects. This paper will be presented by Mr. Ramsdell, who is a landscape architect, and I think we may all expect to get some valuable instruction from this paper.

Mr. Charles H. Ramsdell, Minneapolis, then described "Ornamental Planting for Winter Effect." (See index.)

Discussion.

The President: I wish we might continue this discussion a little longer, but we have not the time to do so, I am sorry to say. The next paper on the program is on the subject of combating aster diseases. Mrs. Odell has made a study of this matter, and she is a competent authority to speak upon the subject, and I am sure she has something extremely valuable to give us along that line.

Digitized by Google

Mrs. Robert Odell, of Minneapolis, then related her experience in "Combating Aster Disease". (See index.)

Discussion.

The President: It is now time for us to close this meeting. I am glad that so many remained, and I hope that you have all been entertained and instructed. I certainly think that you have received some very useful hints in regard to the cultivation of flowers, the desirable sorts to plant, and how to combat various insect pests and diseases. We will be very glad to have as many as will join our society. This society is not for women only, as some suppose, but we would be very glad to have the gentlemen join our society also. (Applause.)

Wednesday Afternoon Session.

The preliminary afternoon session was called to order at 1:30 o'clock, and the half hour question and answer exercise was conducted by Mr. H. J. Baldwin, of Northfield, on the topic of "The Vegetable Garden".

The regular afternoon session was called to order at two o'clock by President Cashman.

The President: We will immediately take up our program for the afternoon, and for the first number on the program I will ask Mr. Tingley to read his paper on the subject of planting plums in Minnesota.

Mr. W. J. Tingley, Forest Lake, then read a paper on the subject of "Comparative Value of Japanese Hybrid and Americana Plums for Minnesota Planting". (See index.)

The President: If there is no discussion upon this paper we will take up the next, which is by Mr. Wedge on the subject of the catalpa.

"Is the Catalpa Worth Planting in Minnesota?" was the topic presented in a paper by Mr. Clarence Wedge, of Albert Lea. (See index.)

Mr. Clarence Wedge: In last night's paper, I think it was the Journal, it mentioned this society as recommending the putting of the best apples on top of the barrel. The title placed at the heading of our report in the paper was very misleading, and I think we are very much misleading each other if we allow that impression to go out. Indeed, on the contrary, I think that we have all along in the past been expressing our sentiment against the practice of putting the best apples on top of the barrel, and wherever it has been done it has been a bad practice, and a great deal has been lost in the sale of apples. I contend that it gives the public a wrong impression when we allow it to go out that we recommend placing the best apples on top of the barrel. There was no suggestion of the kind made in any paper read here, nor was it made in the discussion. The suggestion that was made was to the effect that a good average grade should be placed on top of the barrel. I think we ought to pass some kind of a motion here that would put this thing right in

Digitized by Google

the eyes of the public. I will not spend time to prepare a written resolution, but I will move that it is the judgment of this meeting that the practice of putting the best fruit on the top of any package is bad practice, and that we wholly disapprove of it. (Applause.)

The motion was duly seconded and, being put to a vote, prevailed unanimously.

The President: It might be well to memoralize the press upon this subject and get them to set themselves and our society right in this matter.

The President: We will next hear from one of our young and successful orchardists, Mr. Anderson, of Renville, who will tell us of the best varieties of apples to grow for commercial purposes. At the same time he will tell us of their planting and care.

Mr. G. A. Anderson, of Renville, in a paper presented by him, described the "Varieties of Apples for Commercial Orchards, Their Planting and Care". (See index.)

Discussion.

The President: We will next have the pleasure of listening to Col. Burnap, of Iowa, who will speak on the subject of trees and tree planting.

"Trees and Tree Planting" was the subject of a paper read by Col. W. A. Burnap, a delegate from the Northeastern Iowa Horticultural Society. (See index.)

Discussion.

The Woman's Auxiliary.

The meeting of the Woman's Auxiliary was called to order at 3:15 o'clock by Miss Emma V. White, the president.

The President: The first number on our program this afternoon was to have been given by Mrs. Lundgren, but as she is not present we will take up the next subject. I notice that Mr. Drum is spoken of in the program as a retired farmer, but if he is interesting children in horticulture he must still be actively engaged in the good work.

Mr. H. S. Drum, of Owatonna, then read a paper on the subject of "Interesting Children in Horticulture". (See index.)

Discussion.

The President: This has been an exceedingly valuable discussion, and I think we ought to be congratulated on having Mr. Drum here to give us his paper which has brought out the instructive features which we have heard. I wish we might continue this discussion, but we have a number of other subjects on the program which we must take up. The next subject will be that of wild flowers, and Miss Eloise Butler, Superintendent of the Wild Flower Department of the Minneapolis Parks, will speak to us on that subject.

"The Cultivation of Native Flowers", by Miss Eloise Butler, of Minneapolis, was discussed in a paper presented by Miss Butler. (See index.)

Digitized by Google

The President: The history of a great many improvement associations is usually a very short one, and the early death of the majority of them is easily foretold. However, I am glad to say, that there is an organization that has survived seven years, and we are now going to hear about it. Mrs. Underwood, of Lake City, is going to tell us about the seventh year of their association in that city. (Applause.)

Mrs. Anna B. Underwood described "The Seventh Year in Improvement Work at Lake City". (See index.)

The President: Professor Cady, who is next on the program, is not here at this moment. He was to speak on a visit to Mr. Philip's top-work orchard, but we will now take up the subject upon which Mr. Philips is to speak, and that is the topic of top-working apples.

Mr. A. J. Philips, of West Salem, then spoke on the subject of "Possibilities for Minnesota in Apple Raising by Top-Grafting", exhibiting twenty-four varieties grown in his own orchard top-worked on Virginia crab. (See index.)

Discussion.

The President: It is very much to be regretted that Mr. Kenney and Mr. Dunsmore are not here to read their papers, but they were unable to be present, and we must, therefore, pass them over. However, they will be published in the report, and the members will get the benefit of them later on.

We will now have another paper on the subject of top-working, which will be presented by Mr. Valleau, who is an instructor in horticulture at the State Farm School.

Mr. W. D. Valleau, Instructor at the Minnesota Farm School, at St. Anthony Park, then defined the "Present Status of Top-Working Made up from Reports of Members Sent to the Secretary". (See index.)

The President: We will now have another paper somewhat along the same line, that is, top-working, but presenting a different phase of the subject. Mr. S. D. Richardson, who is an old nurseryman of long experience, will discuss the attitude of the nurseryman towards top-working.

The "Attitude of the Nurseryman towards Top-Working" was then discussed in a paper presented by Mr. S. D. Richardson, of Winnebago. (See index.)

Discussion.

Thursday Morning Session.

The morning session was opened at 9:100 o'clock with a thirty minute question and answer exercise on "Spraying", led by Mr. H. U. Beebe, Field Manager, Jewell Nursery Co., Lake City.

The regular session of the society was called to order by President Cashman at 2:00 o'clock.

The President: The first number on the program this morning is the report of the committee on fruit list. Mr. J. P. Andrews, of Faribault, is chairman of that committee, and I will ask Mr. Andrews to come forward and make his report.

Digitized by Google

The 1912 fruit list as formulated by the committee was then reported to the society by Mr. Andrews, who moved its adoption. (See index.)

Discussion.

The President: I see our good friend, Mr. C. G. Patten, is with us this morning, and I want him to come forward and give us a few words of greeting.

Mr. Charles G. Patten (Iowa): Thank you, Mr. President, but I prefer to listen for a while, and I trust you will withdraw your request that I make a few remarks at this time.

The President: This has been a very interesting discussion on the fruit list, but I think we have closed the matter now, and we will now take up the next item on the program, which is the report of the executive board. Mr. Wyman Elliot, chairman of the executive board, will present the report.

Mr. Wyman Elliot then submitted the "Report of the Executive Committee". (See index.)

On motion of Mr. Husser, the report of the committee was unanimously adopted.

The President: I see Professor Waldron, of North Dakota, has just come into the room. He has been with us a good many years and always has something good for us. Professor Waldron is professor of horticulture at the North Dakota Agricultural College, at Fargo, and represents the North Dakota Horticultural Society. We would be very glad to hear a few words from Professor Waldron. (Applause.)

Prof. C. B. Waldron (N. D.): I understand I am to give a little talk later on regarding the drouth-resisting qualities of certain trees, and I do not know whether I am expected to give that talk at this time or not. I see it is not scheduled for a regular session on the program, but is put in the portion of the program designated as "Chinking". However, before I take up that subject I would like to say a word or two in regard to our North Dakota Horticultural Society. My secretary, Mr. McMillan, has taken a position in the East, and we have no secretary at this time. I was going to get his report and bring it with me, but I did not succeed in laying my hands on it at the last moment and I, therefore, cannot give you the information such as I would like to give if I had the report. I cannot tell just what the membership is at the present time. You know that our conditions during the last few years have been rather trying from a horticultural and nursery standpoint. A great many of the nurserymen doing business in North Dakota have been called upon to replace stock and have been very unfortunate in that respect on account of the lack of rainfall. I think I might as well speak upon the subject assigned me on the program now as any other time.

Prof. C. B. Waldron, Fargo, N. D., then spoke upon the subject of "Drouth Resistance in Trees Suitable for Shelter Belts." (See index.)

Discussion.

Digitized by Google

The President: We are very greatly indebted to Prof. Waldron for this splendid information. I think we all appreciate that this has been a very liberal education to us in the matter of tree planting, and it gives us information of which we can make good use in the future.

I see Mr. Stacy, of the public examiner's office, is with us this morning. He has been looking up a matter of great interest to horticulturists, and we would be glad to hear from him at this time.

Mr. Stacy then spoke at some length on the proper labeling and designation of fruit, and the necessity of proper legislation being enacted covering those features, following it up by the submission of a resolution providing for the carrying out of the plan suggested.

The President: We are very much indebted to Mr. Stacy for this timely advice and suggestion. This is a very important resolution he has laid before us, and we should give it careful consideration.

Mr. Wyman Elliot moved the adoption of the resolution.

Mr. Husser: I want to offer an amendment to the resolution, providing that everyone who sells anything in a package be required to place his name and brand thereon. The speaker told us something about the creameries. He knows that our Minnesota creameries are all proud to have their names on their packages, and not only that, but when some New York commission men some years ago took off the Minnesota name and brand from the Minnesota packages, the creamery men opposed their action and made them put them back again. So I suggest that the name and brand be placed upon every package that is sold.

The President: That is a matter that I think is within the province of the legislative committee, and if there is no objection I would suggest that it be referred to them with power to bring the thing about.

Th resolution offered by Mr. Stacy, following the motion by Mr. Elliot to adopt, was then unanimously adopted.

I have just been informed that Prof. Beach, of Iowa, is present, and we would like to have him come forward and hear a few words from him. (Applause.)

Prof. S. A. Beach (Iowa): Mr. President, Ladies and Gentlemen: It gives me great pleasure to meet with the Minnesota Horticultural Society at this time. The name of the Minnesota Horticultural Society is known throughout the continent as a live society, one that is doing things. You have wonderful opportunities. Located in the upper Mississippi valley, where fruit growing is done as easily as it is in some of the more favored climatic regions, speaking from a fruit grower's standpoint, you have difficulties to contend with, and you have splendid opportunities of developing in this part of the country that which will serve the present generation, and not only the present generation but generations to come, because this country is to teem with a dense population, and in that event you must do it. You have without question all the things that are necessary for the sustaining of a large

Digitized by Google

population in this country. And so you gentlemen who are working for Minnesota horticulture today cannot see perhaps as clearly as you might, but you are also working for Minnesota horticulture tomorrow, and you are not only working for Minnesota horticulture, but you are working for the horticulture of the Dakotas, the Canadian provinces, Wisconsin, Iowa and Nebraska. So we are proud to be associated with you in this work, and I am glad to bring to you this morning the greetings of the Iowa Horticultural Society. We are glad to get the inspiration and the information we do from these meetings.

One day last week I had the privilege of walking over our campus with a lady who was a student twenty-five years ago. The institution has grown a good deal during the past quarter of a century. Then it was housed in practically one building with between three and four hundred students. Now the buildings cover a good many acres, a campus of one hundred acres, surrounded with buildings, new buildings have been put up in place of the old, and Iowa has reason to be proud of her agricultural college as a standard type of that sort of institution. This lady while we were walking over the campus—I did not know what was in her mind—said, "I wish young people when they go to college could be taught to think". I kept on walking with her, and she did not say anything, and I did not say anything, but I was wondering why she should give expression to that kind of a thought. So far as I know she had a good mind, a good, keen, logical mind, and I thought she was able to think well, and I did not understand just the drift of her remark, "I wish young people in college might be taught to think". I said, "I don't understand what you have in mind". She said, "I wish when I was a student here at Ames I might have had some vision of what was coming to this campus. I might have looked forward to see the great development of this institution, one that gathers between eighteen hundred and two thousand students within its walls for instruction". I said to her: "In the next twenty-five years you will see a greater development than the past twenty-five years have brought to pass in this institution", and as I was sitting here in my seat thinking of the opportunities open to Minnesota horticulturists, the thought of what this lady said came to my mind. I wondered how many of us there were if we could see twenty-five years ahead, would have a better and a greater enthusiasm for our work, and a greater satisfaction in what we and what you are trying to do to advance Minnesota horticulture. We need a vision of the future as well as a realization of the present, and so again I wish to say to you that we congratulate you, and through you we congratulate the state of Minnesota for what she is doing in the present and what she is bound to accomplish in the future. (Applause.)

The President: We certainly are pleased to have Prof. Beach with us, and we thoroughly appreciate the good cheer that he brings us.

Digitized by Google

The report of the secretary will be published in the proceedings and it will, therefore, not be necessary to read it at this time.

We will next have the report of the treasurer, and if Mr. Strand is present I will ask him to come forward and give his report.

The "Treasurer's Report" was then submitted by Mr. George W. Strand, of Taylors Falls. (See index.)

On motion of Mr. Wyman Elliot the report of the treasurer was adopted unanimously.

Thursday Afternoon Session.

The preliminary session was called to order at 1:30 o'clock for the purpose of conducting a half hour question and answer exercise led by Mr. Harold Simmons, of Howard Lake, the subject of the open discussion being "Developing the Commercial Orchard".

The regular session of the society was called to order at 2:00 o'clock by President Cashman.

The president introduced Dean A. F. Woods, of the Minnesota Farm School, who addressed the society briefly, and his remarks were directed chiefly toward the end of securing the co-operation of the Horticultural Society in making a creditable exhibit at the Land Show to be held at St. Paul within a few weeks following.

The President: Professor Washburn was on the program Tuesday afternoon, but he was unable to be present at that time to read his paper. He is with us this afternoon, and he will now speak to us on the subject of the house fly and how to exterminate it.

"The House Fly, a Nuisance, and How to Evade It", showing a new fly catcher, was the subject matter of a paper presented by Professor F. L. Washburn, Entomologist, University of Minnesota, St. Anthony Park. (See index.)

The President: Our time is limited, and it will not permit us to discuss this excellent paper presented by Prof. Washburn, although I trust you have all been interested and instructed and will put his suggestions to practical use when fly time comes around again.

We will now again turn to our afternoon program, and I am pleased to announce that the next number on the program will be an exercise conducted by Prof. Beach, Professor of Horticulture at Ames, Iowa. Prof. Beach is to be given thirty minutes to conduct this exercise, and the subject of his talk will be on orchard management.

Prof. F. A. Beach, Professor of Agriculture, Iowa State Agricultural College, Ames, Iowa, then conducted a discussion upon the subject of "Orchard Management". (See index.)

Discussion.

The President: We are very much indebted to Prof. Beach for this interesting talk, and we hope that this will not be the last time that it will be our privilege to hear him.

Digitized by Google

The Election of Officers.

At 3:15 o'clock, the time set aside for that purpose, the election of officers was taken up. (See index.)

Mr. Clarence Wedge: We who have enjoyed these useful discussions for the past few days, and expect to enjoy them tomorrow and the following day I think are all agreed that we should wish all horticulturists throughout our state to have the benefit of these useful papers and discussions, and that the knowledge gleaned here should be disseminated in every town and in every community throughout the state, so that horticulture in this state may go on and develop as it has in the past. I think for this purpose there is no organization that can do this work more effectively than the Minnesota Farmers' Institute, which is a traveling session, visiting almost every portion of the state, and this has also been used in the past as a most effective agency for the purpose of securing members in the association, and now to encourage them in continuing this very effective and useful work in farmers' institutes I propose to present a resolution which I am sure will appeal to you.

Mr. Wedge then submitted the following resolution:

Resolved, That in our judgment there should be a lecturer on horticulture accompanying each institute corps in operation in this state.

Resolved, further, That each lecturer on horticulture with the institute should be encouraged to use his influence in the interests of the State Horticultural Society and in placing the literature of the society in the hands of those who appreciate it by becoming members of this society, and that the necessary brief time be allowed for the proper presentation of this subject from the institute platform.

Resolved, That a copy of these resolutions be transmitted to the Superintendent of Farmers' Institutes in the state.

On motion of Mr. Wedge the resolution was unanimously adopted.

Minnesota State Forestry Association.

The annual meeting of the Minnesota State Forestry Association was called to order at 4:00 o'clock by the president, Mr. J. E. Rhodes, of St. Paul.

The first number on the program was the "President's Address", delivered by Mr. J. E. Rhodes.

The President: There are several men on our program this afternoon who are not present, which we very much regret, but there are also several here who are well qualified to take their places, and for the first number I am going to call upon Mr. D. P. Tierney, who is assistant state forester. Mr. Tierney has been a member of the faculty of the Minnesota Forest Service and has also been in the United States Forest Service.

Mr. D. P. Tierney then delivered an address upon the subject of "The Work of the State Forest Service".

Digitized by Google

The President: Evidently the co-operation of the railroads and the lumbermen in this work is a long step in the right direction.

Mr. Cutner is present and he will speak to you upon the duties of a patrolman.

"The Duties of a Patrolman" were then described by Mr. Cutner, of St. Paul.

The President: One of the institutions the state is proud of is its forestry school. It is one of the best of its kind in the United States, and it has one of its schools in Itasca State Park and one in Cloquet Park. Mr. Wilson, who spent the summer at the school in Itasca Park, will tell us some of the experiences the students went through at that school.

Mr. Wilson then spoke at length on the subject of "The Forest School in Itasca Park".

The President: Before adjournment I want to say we heartily appreciate the interest you are taking in the work of the Minnesota State Forestry Association as shown by your presence here this afternoon. I thank you.

Friday Morning Session.

The preliminary half hour question and answer exercise was conducted by Mr. Charles Haralson, Superintendent Minnesota State Fruit Breeding Farm, Excelsior, on the general topic of "Growing New Fruits". (See index.)

The regular session was called to order at 9:30 by President Cashman.

The President: The first number on our program this morning is a paper by Mr. Husser, whom you all know is a successful fruit grower, who will tell us about the farmer's garden and orchard.

Mr. Henry Husser, of Minneiska, then read a paper on the subject of "The Farmer's Fruit Garden and Orchard". (See index.)

The President: I am now going to call on our hustling young orchard expert, Mr. Kirkpatrick.

Mr. K. A. Kirkpatrick, of the State Agricultural School, St. Anthony Park, then illustrated "Practical Orchard Pruning". (See index.)

Mr. Kirkpatrick: Last year I had the privilege of standing before you and trying to tell you what an extension specialist in horticulture was. I think there are few in the audience today who have not a little better opinion of what an extension expert means. I think you will bear me out in saying that he has been flying around the state pretty freely, whether he did any good by so doing or not. In this paper I have outlined what I propose to do the coming year, and I expect to have your hearty support and co-operation in what I am trying to do. I am as vitally interested in the horticulture of this state as any one of you, and I trust that we may get together the coming year in a way that will benefit us all.

The President: We have with us this morning our old friend, Mr. Patten, of Charles City, Iowa, and I am going to ask him to

Digitized by Google

speak to you a few moments. As you know, Mr. Patten has had a great many years' experience in fruit breeding, and he is thoroughly qualified to talk upon that subpect, and I hope he will give us a few thoughts along that line.

Mr. Chas. G. Patten (Iowa): Before beginning my remarks proper I want to say that it always gives me great pleasure to meet with the horticulturists of Minnesota. I have been coming here so long that I know no boundary now between Minnesota and Iowa. I feel as much at home here, Mr. President, as I do in my own state. I have received many good words from people of Minnesota, and I want to thank you for the many courtesies and kindnesses you have shown me in times past. There are a great many things that I would like to say in reference to Minnesota horticulturists if I could speak my thoughts when I am on my feet, but not being accustomed to speaking to a public audience very much, I am sometimes at a loss as to how to express myself. I see my old friend Elliot and a number of the other older members of the society, and my mind goes back to the early beginning of horticulturing in Minnesota and Iowa. When I think of the men with whom I have been associated for thirty years or more in Iowa and Minnesota and Wisconsin, and remember that so many of them have gone from us within the last twenty years, I feel that I shall not be likely to stay long among you, and yet it has so happened that I have been left while Mr. Dartt, Mr. Harris, Mr. Sias and so many of the older ones of this organization have gone. There are really but few of us older ones left, and it makes me sad when I come into this meeting or when I attend the Iowa meeting to see so few of those older pioneer workers, such as Mr. Elliot, and I might name Mr. Latham, because he has been for so many years an enthusiastic and indefatigable worker here. I can pursue this thought no longer, and I thank you for your attention.

I wish to say here in regard to several matters that I am bringing to your attention that this is a sort of a report that I made to the society of Iowa. It is not long, and it is something along the line of fruit breeding work, that I have followed so long and have so often talked upon, and I think it may be of as much interest to you, I presume, in fact I know it is of as much interest to you as it is to us, because the conditions apply to you as well as they do to us, and for that reason I have concluded to give you a part of that report.

Mr. Chas. G. Patten, of Charles City, Iowa, then read a report on "Fruit Breeding Work in Iowa". (See index.)

Discussion.

Capt. A. H. Reed: I have had some experience in planting catalpas, and I have found it to be one of the fastest growing trees I have ever planted.

Mr. Patten: They are quite a rapidly growing tree, and if we will take up the question of the development of this catalpa tree, as its merits demand, it will be only a comparatively short time

Digitized by Google

before we will have established a type of forest trees that are perfectly adapted to this section of the country.

Mr. Husser: Will the catalpa grow in moist soil or in dry soil?

Mr. Patton: They will grow better in medium soil, I should say, as between the two.

Plant Breeders' Auxiliary.

The Plant Breeders' Auxiliary was called to order by the president, Mr. J. M. Underwood, at 10:30 o'clock.

The President: In order to get through the program in the time prescribed, I will not try to make any address at this time. You know this auxiliary was formed for the express purpose of stimulating the home people in this work of breeding fruit rather than in the way of introducing new varieties of fruit. We have enough varieties, but we want better varieties. We are looking, for example, for an apple as hardy and prolific as the Duchess, with as good a quality as the Wealthy, and that shall be as good a keeper as the Malinda. There are a number of other ways in which we can enhance the interest and value of horticulture, and we are trying to see what we can do to assist Nature, or to copy from Nature, as has been done by our distinguished friend, Mr. Patten, who has done so much along this line of work, and also Prof. Hansen, whose work is known all over this country and who even has an international fame, and also our professor here—I am going to call him professor because he is certainly entitled to that distinction—Mr. Haralson. I think he certainly ought to be given a degree of some kind in recognition of the excellent work that he has done, because he is certainly entitled to a reward for the valuable service he has rendered to horticulture. The work these men are doing is not only benefiting their particular state, or their particular section of country, but it is a benefit to the entire Northwest, and I think we should feel pride that we can count these men as members of our respective organizations.

The first number on the program this morning is a sort of a resume of the work of the State Fruit-Breeding Farm for 1911, and this report will be made by the superintendent, Mr. Chas. Haralson.

The work of "The State Fruit-Breeding Farm for 1911" was then described by Mr. Charles Haralson, Superintendent, Excelsior. (See index.)

The President: I am sure you have all been very much interested in this excellent report, and I think we will all in the future look with a great deal of interest upon the experiments that will be made there. As you know, the Horticultural Society annually appoints a committee to inspect the state fruit-breeding farm and report to this meeting and to the Board of Regents, and the committee this year consisted of Mr. Ed Yanish, of St. Paul, and Mr. E. A. Smith, of Lake City. I have the pleasure of introducing to you Mr. Yanish, who will make the report for the committee.

Digitized by Google

"Report of Committee on Examination of the Minnesota State Fruit-Breeding Farm" was then made by Mr. Yanish, of St. Paul. (See index.)

The President: The next paper is right along this line, and will be given by Mr. Dorsey, who is an assistant in horticulture at St. Anthony Park, and who will tell us how we can aid in this fruit-breeding movement.

"How We Can Aid the Fruit-Breeding Movement" was then told by Mr. M. J. Dorsey, Assistant in Plant-Breeding, State Experiment Station, St. Anthony Park. (See index.)

The President: We will now take up a report by Prof. Hansen of his last year's experience in fruit-breeding. I know this is going to be an extremely interesting report, and you will all want to hear it. Prof. Hansen never comes here but what he gives us some of the most valuable and beneficial information in regard to fruit-breeding that we could possibly have, and I do not think it will be an exception in this case.

Prof. N. E. Hansen, Horticulturist and Fruit-Breeder of the South Dakota Agricultural Station, Brookings, S. D., then gave some "Experience Notes of the Season in Fruit-Breeding". (See index.)

On motion of Mr. Latham, Mr. Clarence Wedge, of Albert Lea, was elected president of the Plant Breeders' Auxiliary for the ensuing year, and Mr. J. M. Underwood, of Lake City, was elected secretary.

The meeting was then declared adjourned until 1:30.

Friday Afternoon Session.

Owing to the absence of Mr. Wm. M. McDonald, Manager of the Excelsior Fruit Growers' Association, the question and answer exercise scheduled for 1:30 was abandoned.

The regular session of the society was called to order at 2:00 o'clock by President Cashman. The general subject of the afternoon program was "Spraying and Marketing".

The President: The first number on the program this afternoon is a paper by Mr. Ashby, Superintendent of the Insecticide Department of the Sherwin & Williams Paint Co., Chicago.

In a paper presented by Mr. H. M. Ashby, of Chicago, he described "Spraying Materials and Foliage Injury, in Connection with Caring for an Orchard". (See index.)

Discussion.

The President: This is the first time that Prof. Cady has had an opportunity to be with us, and I am now going to ask him to tell about his visit to Mr. Philips' top-worked orchard at West Salem.

Prof. Leroy Cady, Professor of Horticulture, Minnesota Agricultural College, St. Anthony Park, then described "A Visit to A. J. Philips' Top-Worked Orchard".

Digitized by Google

The President: We will now take up a subject which is of considerable interest to nurserymen as well as to orchardists at large. There has been a great deal of discussion in regard to inspection laws of nursery stuff, and Mr. Scammell, who is assistant nursery inspector, will tell us something about needed laws.

"Needed Changes in the Horticultural Inspection Law" were then discussed in a paper presented by Mr. H. B. Scammell, Assistant Nursery Inspector, St. Anthony Park. (See index.)

The President: While this is a very interesting subject, I think we have devoted all the time to it that we can spare, and in order to get through with our program in time we must take up the other subjects.

We will now take up a different subject, but one that is of great interest to us all. Mr. Mitchell, who is a practical and successful nurseryman at Owatonna, is going to tell us about the proper way to market fruit.

"Providing a Market for Fruit" was then discussed in a paper presented by Mr. D. M. Mitchell, of Owatonna. (See index.)

The President: Now before taking up the two minute speeches, the time for which is almost at hand, we have time for another paper which appears on the program under the heading of "Chinking", and I am going to ask Mr. Sahler what to do with unsalable fruit. I think Mr. Sahler has had considerable experience, and he can very likely give us some very valuable pointers.

Mr. Emil Sahler, of Waseca, then read a paper in which he told the society "What to Do with the Unsalable Apple". (See index.)

Discussion.

The President: I note that Prof. McCall of the Red River Valley Society is with us this afternoon, and I am going to ask the professor to say a few words to us.

Prof. McCall (N. D.): I wish to bring the greetings of the Red River Valley Horticultural Society to your society. This meeting has been a great inspiration to me, and I have absorbed just as much possible, which I shall try to take back to our society. In our country we are blessed with different conditions than those that you have in southern Minnesota. We are where the winds come with full velocity, which tends to dry out the soil, and then also our soil is different from what it is here. For those and various other reasons there seems to be a lack of confidence among farmers about tree planting, and I do not believe that they get the inspiration that you get in that direction. They heard this past year that there was a great deal of fruit down here, but if there was, and I think there was, we did not see any of it. The fruit-growers of Nebraska, Missouri and Illinois sent hundreds of car loads up there and sold it on the market, and we hardly saw a Wealthy or any other variety that is grown here. On account of this lack of confidence our people have not the interest in fruit tree planting that you have here, and our society is not as strong as I would like to have it. I would very much like to see some of the spirit and enthusiasm that has characterized your meeting here. I would be very glad

Digitized by Google

to have some of your enthusiastic horticulturists come up and help us out. I also would like to have you start a trial station at our school of agriculture. We are just getting started in horticultural work, and I would like to call on you for help and have you make a move in that direction. I will not take up any more of your time, but I simply want to thank you for giving me the opportunity of meeting you and saying a few words to you. (Applause.)

The President: We have now come to the time when we must close our meeting, but preceding the actual closing we will take up one of the most pleasant features that we have carried out in our society for a good many years. I refer to the two minute speeches by various members and visitors, which have always afforded us a great deal of pleasure, and at the same time a note of sadness has run through them because at the next meeting we have almost always been sure to miss some of those who were present at the previous meeting. Now in order to give every one an opportunity to speak who wishes to speak and whom I am going to call on, I am going to ask that these speakers be limited strictly to two minutes. (See index under "Two Minute Talks".)

On motion of Mr. Latham all visiting delegates were made honorary members of the society for one year.

The President: In closing I want to thank the members of sister societies who have contributed so much to the success of this meeting. I think the success of our meetings is in a very large measure brought about by the presence of members from outside our own society, and we appreciate very much having them with us, and if those that are with us from year to year are a fair sample of the members of sister societies, we want to meet as many of them as possible every year. I hope you all can come again. I believe that is all that we have to take care of at this time. This has been a very successful meeting in point of attendance. I want to thank you all very much for your forbearance with me and the assistance you have given me in conducting this meeting. I hope you will all be with us again at the summer meeting and at the annual meeting next winter. With this I will bring this very successful meeting to a close and bid you "Good-night". (Applause.)

Digitized by Google

Annual Meeting, 1911, N. E. Iowa Horticultural Society.

J. M. LINDSAY, DELEGATE, AUSTIN.

The meeting was called to order by President G. D. Black, and Rev. C. H. True gave the welcoming address, which was well fitted for the occasion. Immediately after presenting my credentials I was made an honorary member of the Northeastern Society.

The display of apples was a credit to Iowa; there were in all about 300 plates. Wealthy was the favorite for a fall apple. Malinda and Jonathan, Grimes Golden and Northwestern Greening were the favorites for long keeping. The Malinda is an apple that ought to be planted more largely, top-worked to Virginia crab or Hibernal.

Chas. F. Gardner, of Osage, Iowa, started the ball rolling with his everbearing strawberry, and it could plainly be seen by the questions that all were interested. He showed photos of pickers and crates of strawberries in the field late in September.

C. G. Patten, Charles City, exhibited some fine specimens of seedling apples.

Mrs. H. J. Hess, Waterloo, Iowa, read a paper on "The Advantages of Birds to the Fruit Grower," and told of certain birds which were death to some kinds of insects, which covered a greater part of the troublesome pests of nurserymen. Professor Wesley Greene talked on propagating from wood cuttings and outlined a very interesting subject. Clarence Wedge, Albert Lea, Minn., spoke about his trip overland to North Dakota.

F. C. Wildhagen, Waterloo, Iowa, read a valuable paper on "Strawberry Culture," which is a large industry around Waterloo. His paper was admired by all who were present. Considerable discussion took place and all questions answered from long experience by the writer.

Mrs. Clarence Wedge, Albert Lea, Minn., read a paper on "Flower Gardens for Busy People," outlining a small flower garden so as to have flowers the summer through, speaking of shrubs, bulbs, lilies, and some seed flowers. This is a subject that should be given more attention, as it is sadly neglected in the country, where room is plentiful, to cheer the family during the pleasant summer evenings when they can sit on the porch viewing the magnificent blooms.

Elmer Reeves, Waverly, Iowa, spoke on "Sugar Beets and the Process of Working the Beets up into Sugar." The Northeastern Society was so favorably impressed with Waterloo, they voted unanimously to hold the next meeting in the same place. I want to express my appreciation of the kind reception and many courtesies extended to me as a delegate from Minnesota to the Northeastern Iowa Society, and every man there deserves great credit for the work they are doing along fruit growing lines.

Digitized by Google

Plant Breeders' Auxiliary, Annual Report, 1911.

CLARENCE WEDGE, SECRETARY, ALBERT LEA.

I find that we have over a hundred active members on our roll, including only such as are actively engaged in planting seeds and making regular reports of their work.

The following is a summary of the work up to the present time:

Number of seedlings planted: Apple, 5,324; plum, 1,997; cherry, 325; pear, 90; currant, 220; gooseberry, 195; raspberry, 21; strawberry, 325; peach, 62; grape, 50.

In this report I do not include such professional growers as Mr. Patten or the work of Supt. Haralson, of our own fruit-breeding farm.

Mr. Chas. F. Gardner, of Osage, Iowa, one of our most devoted members, is also doing such a large work that it seems to deserve a separate report, as follows:

Apple, 1,000; pear, 100; gooseberry, 100; plum, 1,000; currant, 100; raspberry, 500; blackberry, 10; strawberry, 70,000.

This report would seem to prove most fully that the plant breeders of our society are responding nobly to the call made upon them by the organization of our auxiliary. And with such a number of seedlings to be watched over and fruited within the next ten years, there is every reason to hope that new varieties of great merit will be brought out and become valuable additions to our list of northern fruits.

There is no doubt that the distribution of apple seed by the society is greatly appreciated, and that this policy ought to be continued and the list of seeds extended to include several other fruits, such as the pear, currant, gooseberry, raspberry, strawberry and grape. I believe that well selected seed of all of these fruits would be eagerly taken by our members at a price that would pay for the gathering and mailing.

I believe that it might be well for the society to arrange with members who are situated so as to be able to gather choice seed of each of these fruits to supply our secretary with seed properly cured for sending out in packages. With the exception of the apple and pear, all of these seeds could probably be kept over for a year if not taken up the first year offered.

Digitized by Google

Nuggets from Two Minute Talks at Close of 1911 Annual Meeting of the Society.

Mr. J. H. Mather: Flowers interest the ladies, although they should interest every one. Several years ago—it was before we had the lawn mower—my lawn was large and sloped away from the road, and I used to mow my lawn with a scythe, but that was hard work and took a good deal of time, and so sometimes it was neglected. It got all over-run with quack grass, and every fall it was full of June grass, but it would be so matted down that I could hardly go through it with the scythe to mow it. I looked the thing over one day, and I said to myself that it didn't look like home. I mowed it as well as I could, and then I plowed it up, manured it in the fall, and the next spring I cultivated it and later put in potatoes, and in two years after I had cultivated it there was not a sign of quack grass in it. As soon as I got the grass out and had it subdued, I planted flowers.

Capt. A. H. Reed: Well, I don't know whether you are going to like what I am going to say, but I am going to criticise a little. I am going to suggest to Mr. Latham that when he puts a man on the program, and he promises to prepare a paper, and he does not stand by his promise that he make him pay a dollar. (Laughter and applause.) Well, if you think that well of it I am going to say, make it five dollars. (Laughter.) I came here to hear a certain paper, and in place of hearing that paper another man gets up here and reads a paper which I do not want to hear at all and do not care anything about, but nevertheless I have got to sit here and hear it. When a man is put on the program he ought to be here and read his paper, or else inform the secretary that he is not going to be here and not going to read it.

Secretary Latham: Well, what are you going to do if he has the rhemuatism? There have been the usual number of subjects on the program this year, but on account of illness and other causes a number have not been here, probably a larger number than ever before to my knowledge. I cannot keep a string on them, although I try to get their papers if the readers themselves are not here. I have all the papers here except that of Mr. Kenny. We have not read them for the reason that it has not been customary to read the paper of anyone who is not here to read it himself, but these papers will all be published in the annual report, and everybody will have the benefit of them who reads them. I think it is well understood that when a person prepares a paper and sends it in, and he is not here to read it himself, that it will not be read, although it will be published in the annual report.

Mr. F. C. Gardner (Iowa): I have attended a good many sessions of this society, and I am always happy when I can be here. This book I am holding in my hand is our last annual report of the Iowa society, and I just want to read to you a little bit of the address of our president: "I have heard a great deal said on the floor and in the way of reports about the great attendance and the

Digitized by Google

wonderful interest shown at the annual meeting of some of our sister state societies, especially to the north. This talk makes me tired. Really, I have been expecting that some of our members would ask me for a letter from our society to some of these other societies, because they seem to display more interest in what those societies are doing than what we are doing at home. I would be in favor of giving them credentials if they were not such really good folks. However, I think we might take a lesson from what they are doing. We want some young blood in our society, and we want to see that we get in some real live members." I want to say, Mr. President, that the proceedings of this society are very applicable to the conditions which exist in northern Iowa. The problems that the northeastern Iowa society has to work out in the territory embraced in their association are almost identical with yours, and for that reason your meetings are of great interest to me.

Mr. J. O. Weld: I have been greatly enjoying the meeting this week. Last year I was sick and could not be here, and I missed the meeting very much. I did not feel particularly disappointed in some of these men not being present who were on the program, except that I was anxious to hear from the man who shipped his apples to the commission house and how he came out. I want to tell you how my friend Kenney came out. He shipped a hundred and twenty-seven barrels to Minneapolis, and he wrote me that when he got his returns he came within $2.85 of getting what his barrels cost him. (Laughter.) And that is all he got.

The President: We have with us a member who has not been present at our meetings for a good many years, since he has been engaged in work in the South, but I see he is back again in Minnesota, and we appreciate his presence and welcome him back and want to hear a few words from him now. I am going to call upon Mr. Roger L. Mackintosh.

Mr. Mackintosh: Mr. President, at this time I want to ask your indulgence for a few moments in speaking about the work of our agricultural high schools and what they are doing in the state of Minnesota. You know our last legislature started a number of agricultural high schools, and this last year twenty more were added, and now we have eighty-five agricultural high schools in the state. These agricultural high schools are also designed to assist in the work of domestic science, and as fast as possible teachers of domestic science are installed. In starting this work we have had the greatest difficulty to get good men. I have been in this state a good many years and I know something about Minnesota conditions. A great many people that come in from the outside do not know our conditions. It is our object to cover the ground as well as we can with the material and the facilities we have at hand. We are trying to get down to the people, and we should have the support of this society and the state at large in every way possible. (Applause.)

Mr. K. A. Kirkpatrick: We met today and took some definite action in the way for forming a central association to take care of

Digitized by Google

the marketing of fruit. We have twenty-six names entered on our list as charter members, so we are doing something along that line. We hope to make this a vital organization in the state and one that shall bring dollars and cents to our growers. We want it to be educative, because we wish to educate the grower to the market requirements and market specifications, as well as taking charge of his product and placing it where it will bring him the greatest return. The aim of the organization is to bring the grower and the market together. Last fall when I was out attending county fairs I was at Wheaton, and while there a man shipped in a car load of apples from eastern Wisconsin. They were small and on the regular market would be regarded as almost unsalable, but he sold them for a dollar and ten cents a bushel. When I was at Canby a man shipped a car load in from southern Iowa and was selling them for a dollar a bushel. They were almost exactly the same kind of stuff as those from Wisconsin, and yet while there was a large crop of good Minnesota apples there was not one offered for sale, while those apples from Iowa and Wisconsin were nothing but culled fruit that was picked up off the ground. If that condition of things exists there must be something wrong somewhere. There are all kinds of markets for fruits, and there should be a good market for our Minnesota fruit. What this new organization contemplates is that the marketing shall be conducted on a business basis, and that the sale between the grower and the market shall be conducted in the proper way. (Applause.)

The President: I am sure the plan as outlined by Mr. Kirkpatrick will strike a responsive chord in the hearts of fruit growers because it is something that has been needed in Minnesota for a long time.

Mr. S. H. Drum: Fifty years ago this month I commenced to teach the first school in Steele county, and from that time to this I have been interested in the welfare and the education of young people and children. I have a number of children of my own, and they have all been through the high school, and I want to say that I am not going to cast any aspersions at the high schools. However, I believe, as I said in my paper, that many superintendents and principals of high schools are so obsessed with their own ways and their ideas and notions that they are not ready or willing to take up anything new, anything that will be of practical every-day value to pupils, unless they are forced to do it.

Mr. E. S. Pabody: I have attended these annual meetings for a number of years and gathered inspiration, and I always go to work the next summer with a deeper interest after having been here. This society is doing a work for the people of Minnesota and the Northwest that can hardly be realized and is not realized by the people in general. I was honored today by having Mr. Patten take luncheon with me. If the president of the United States had taken luncheon with me I do not know that I would have esteemed it a greater honor, or not as great an honor, as to have Mr. Patten sit with me at table . (Applause.) I consider Mr. Patten as one

Digitized by Google

of the greatest benefactors of the people in the United States today. He can never be repaid for the work he has done and is still doing, for the sacrifices he has made, for the hardships he has borne, and the only way that he can really feel repaid is by regarding the results of his work in the way of a benefit to the people. Mr. Patten has originated some fifty varieties of apples not known before. We appear in this world to make it more beautiful, happier and better, and I do not know of any organization in this state that does more for the upbuilding of the state and that does more to promote the health, happiness and welfare of its people than this society." (Applause.)

Prof. F. A. Beach (Iowa): Thus far the mass of the farming public have been turning their attention to the production of farm crops rather than to the growing of fruits. However, the time is coming and is here when fruit growing is to receive the attention it should have. The production of fruit will be developed along two lines: first, by learning better how to take care of fruits, how to induce a better growth; and, second, learning better how to produce superior varieties of fruit. As an evidence of our progress along this line I might state that we are receiving recognition in the West that we have not before received on account of the quality of some of the apples which we produced. We are receiving through the United States government plants that are brought by their experts from all parts of the world, and some of these things will undoubtedly be of value from an ornamental standpoint, and also to orchardists either directly or indirectly—directly by giving something that will be of value in itself, and indirectly by introducing a new strain of blood by which established kinds may be improved, the same as we are using the Siberian and the Duchess blood in this part of the country.

The President: I will next call on a man without whose presence this horticultural society would not be considered complete. I cannot recall that he has ever missed a meeting since I have been connected with the society, and more than that, he is a charter member of this organization and has been a leading factor in the growth that this association has made up to the present time. I want to call on Mr. Wyman Elliot to say a few words to us. (Applause.)

Mr. Wyman Elliot: In talking with one of our leading commission men yesterday he advanced this idea, or rather he asked me this question: "How many car loads of apples has Minnesota produced this year as near as you can estimate it?" I told him I supposed he was better fitted to answer that question than I was, that I did not know, but perhaps six or seven hundred, and he said that he estimated that over a thousand car loads had been produced this year. If there have been a thousand car loads, there have been a thousand car loads go to waste. I believe there has been wasted a hundred thousand bushels of apples in Minnesota this year. I have been connected with this society since its organization, and it gives me great pleasure to see the fruit on exhibition below. I am happy to meet you all again. (Applause.)

Digitized by Google

Mr. A. J. Philips (Wis.): If I did not like to come here I would not be here. I do want to say something to Prof. Beach. I went the other evening with my wife to hear Mr. Record, of Atlantic City, N. J., the private secretary of Governor Woodrow Wilson. He is as fine a public speaker as I ever heard. We came up here to the church the next morning and my wife said to me, "I didn't think that man was a horticulturist. He didn't say anything about it." I said, "What made you think that he was a horticulturist?" She said, "Why, that same man spoke yesterday morning." She took Prof. Beach for Mr. Record. (Laughter.) I was going to say that the Lord started out to select the best men He could find to adorn and beautify this state with fruits and flowers, and I was going to start in with men that I have been personally acquainted with, every one of them. The first man is John H. Stevens, whom the older members of the society remember. I was with him thirty-five years ago at Rochester at the fair, and he was outlining his plans for planting trees and growing flowers all over the state. The next man I had a chance to meet was Dr. P. A. Jewell, the founder of the Jewell Nursery Co. He was a stanch Quaker, and he was like a lot of horticulturists I can see right around me—their wives are better than they are. (Laughter and applause.) He had a wife who was an ornament to any society in the world. He has visited me, and I was glad to have him there. He was another man who started out to beautify the world, and you can see how well he has succeeded by noticing what he has established at Lake City, and I am mighty glad that they are keeping on with the good work that he started there. Then there was Peter M. Gideon. Peter M. Gideon was a peculiar man. He would not show his apples at the fair because they had horse racing, and he was kind of a stubborn old fellow, and they could not do anything with him. They wanted those apples and they wanted Peter, too, so they invited him to attend a meeting of the horticultural society to see if they could not fix matters up in some way so he would take hold of the matter. Prof. Porter was president at that time, and the meeting was held in this city somewhere down on Bridge Square. They agreed to let him come back into the society, and the spirit that was shown there was good. They stated their terms to Peter and he accepted them. Peter Peffer and I were there from Wisconsin, and they appointed us as a committee to go out into the other room and bring in Peter and his wife and introduc him to the horticultural society of Minnesota. Mr. Peffer said to me, "Philips, I don't like very well to do anything like that." I was glad to do that, and when Mr. Peffer and I brought Peter and his wife into the room the people all rose to their feet, walked up in front and shook hands with the old gentleman and his wife. It was a good thing for the society and the state that they got him back again. No man had ever done so much for horticulture in a practical way as Peter M. Gideon when he brought out the Wealthy apple. Then there is Grimes, Harris, Robertson, Green, Lord, Yahnke, Leach, and a great many more that I might

Digitized by Google

mention. Yahnke was a grand old man. I figured up twenty of them the other night that I was personally and intimately acquainted with. Ditus Day is another one that is gone. These men were all kings in their own right. Although the world has not acknowledged them, yet if the fruit of their labor was taken away from the world the people would come to realize what these men did for them. They were all men of splendid character. I do not wonder that Minnesota is so far ahead in its horticulture when it has men like these to push it and develop it.

Col. W. A. Burnap (Iowa): There is one thing I would like to say, and that is about the action which your legislature and your people are taking in regard to horticulture in the high schools. You have taken the right step in the right way. For a great many years I have thought that our high schools were run on an entirely wrong basis. I have thought that our high schools were being conducted as a preparatory school for college rather than as a place in which to prepare pupils for life. It seems to me that is entirely wrong. Educational statistics show that only five per cent of high school scholars enter college, and therefore only five per cent are educated for their benefit, and the other ninety-five per cent are left out. My work has brought me into contact to a considerable extent with superintendents of high schools, and I find them nearly all content with the present system, and they think that everybody must do the same thing, that the high school education must prepare the pupil for college. The step that has been taken in this state is one in the right direction. The aim of the agricultural high school is to make the course preparatory for the life of the pupil, and not to cater to the five per cent that will eventually enter college.

Mrs. Jennie Stager: During the years I have been here I have never had more pleasure than when attending these meetings. About the first thing I do when I come here is to look for Mr. Long, because I know if Mr. Long is here everything will go all right with the meeting; then the next thing I look around until I find Mr. Elliot and all those people who are here every year. I remember the first time I attended one of these meetings was in a little hall down the street here. There was not the exhibit of fruit that we find here today, but there was a long table in the room and behind that table was Mr. Elliot examining the apples, and I went to him and wanted to find out something about fruit. I came here from New York city, and I did not know much about fruit growing, but I wanted to find out all about it, and when I met Mr. Elliot I thought I had met the right kind of a man who could tell me what I wanted to know. I tell you I did learn something. I learned something not only about fruit, but about the pleasures of horticulture, about right living, and I don't think things like that can be learned anywhere better than in this horticultural society. This society and its people teach us that there is more in living than merely making money.

Prof. N. E. Hansen (S. D.): The main thought I would like to leave with you in a two minute speech is something along the

Digitized by Google

line of extension work. Farmers' institutes are a great help. They certainly stimulate and arouse interest. However, the last step in the evolution is this university extension work that Mr. Kirkpatrick spoke of today. But we need to go further than that, We need this European idea of agricultural field men, of agricultural experts. I am at a loss to translate the word they use for a consulting expert, because that word expert is over-worked somewhat. These men—one man for each county—make a visit to any farm wherever they may be called to give the benefit of their advice. This expert does not know it all, but at least he knows where to go to find out. The dairy industry of Denmark has been built up to its present imposing proportions—a country about one-quarter the size of Iowa—within comparatively recent years, and sends fifty million dollars' worth of butter to London every year. These experts work along every line of agriculture, and if a farmer does not obtain the exact knowledge that he ought to have to conduct his work properly it is his own fault. If we had men in every county to help when called upon in our horticultural work, I believe we would make wonderful strides along that line. They could help the school teachers in their work both in agriculture and horticulture, and they could teach farmers to graft and bud, and they could show the farmers' boys how certain work should be done, and it would be extremely helpful work. Furthermore, they would learn to co-operate better. One of the great advantages in Denmark lies in the fact that farmers know how to do team work. In their agricultural schools in Denmark they learn how to do that. They are taught in the agricultural schools how to work together, and they make a great success of farming. If we can get the youngsters started right in this agricultural field work, it would be a most desirable thing, and this university extension work that has been projected is a step right along the proper line to accomplish this end, only it does not go quite far enough as yet. We need efficient work in every county, we need expert men in every county in the state to carry out the work along these lines. I want to say further that no politics enter into these appointments I have spoken of. They are all college men, and they all have a thorough scientific education, and if we could have this system of field men introduced into our work it would be a wonderful benefit if it was carried out upon a non-political basis. (Applause.)

Mr. C. G. Patten (Iowa): In my remarks this morning I neglected to mention the name of Mr. Jewell when I spoke of the old horticulturists whom I knew in this society many years ago. Mr. Jewell was the founder of the Lake City Nursery, that is now located at Lake City. I think many of you older ones knew Mr. Jewell before he passed away. Mr. Underwood, when I knew the beginnings of that nursery, was a young man in the work, scarcely beginning, when I knew of Mr. Jewell and his work. There is quite a history connected with Mr. Jewell and other men who were pioneers in horticulture in Wisconsin and Illinois, and in Minnesota in particular. My memory goes back to the time

Digitized by Google

when it was almost nothing but the crabs that people were interested in in the way of apples, the Siberian crab. I remember a time at the state meeting in Madison, Wisconsin, when Dr. Warder, the author of Warder's Pomology, commented on the little Siberian crab, about half the size of a Hyslop or a Transcendent. Mr. Jewell was one of those men who became intensely interested in hybrids that were introduced in this state. We might say that really was the beginning of our horticulture in the Northwest, but our horticultural men of that time didn't know of anything better than those Siberian crabs. If we trace the history and the achievements of horticulture in this state we find a situation that is perfectly amazing. We have made a most wonderful progress in this entire Northwest, and what other developments it may bring in the near future can only be guessed at.

Mr. George J. Kellogg (Wis.): I like to come here because I get into good company. This is the cleanest set of horticulturists I have met with in the United States. I don't think I know of a single one who smokes, chews, swears or drinks, and I hope there are none such in the society. I have been coming here now for about forty years more or less, and for many years regularly. During those forty years I have had a checkered life in the horticultural business. I commenced setting out trees in 1854. I didn't know anything then, and I have not learned much yet. In 1854 I had a clean forty acres of prairie. I set out the same varieties they had in York state. I planted Rhode Island Greening, Spitzenberg, Baldwin, Winter Winesap, Yellow Bellflowers, and a number of others, and out of the three hundred trees that I planted I got one Duchess that is alive today, one Grimes is alive—all the rest of the three hundred went up in smoke. The winter of 1855-6 took most of them, the winter of '61-62 took the rest of them, and of those that I planted afterwards the winter of '81-2 took almost the whole planting. I set out one hundred pear trees, and I set out one hundred English or European plums, and they all went the same way. In the fall of 1899 I lost my whole nursery. It cleaned out every apple tree in the nursery, two hundred rose bushes in the front yard—there was nothing left. Since that I have been growing strawberries. I turned what there was left over to my boys and I skipped out, and I am now running a little garden at Lake Mills of a quarter of an acre, seventy fruit trees, about thirty bearing, about two hundred ginseng plants and strawberries without end. At one end of the garden I have thirty bearing grape vines, and I have one apple tree with forty varieties growing on it and one pear tree with a dozen varieties, and I am enjoying myself in looking over my experience of the previous forty years. I want to be here to fulfill that offer I made today to furnish you with strawberry shortcake at the annual banquet of this society five years from last night. I mean strawberry shortcake made from everbearing strawberries. I will do it if you want me to, and I expect to be here. (Applause.)

Mr. O. W. Moore: Mr. President and Fellow Horticulturists: I am very glad to witness a change in the method by which our

Digitized by Google

present students and the coming generations are to be educated. We have built this season in Spring Valley a twenty-five thousand dollar high school building to which we propose to add an agricultural and horticultural department, and connected with it a course in stock growing and dairying and everything that will be an aid in carrying forward the work of farming in the community and that will be a benefit in the training of farmers' boys and girls. This is to be done that they may learn something of the use of tools in working with both wood and iron, that they may be able in after life to help themselves along in this direction in mechanical work. Then there will be a department of domestic science put in for the girls and needlework and things of that sort which they will be glad to avail themselves of in later years. Heretofore our high school graduates knew nothing about these different branches I have mentioned. Some of our graduates could not drive a nail without pounding their fingers. They knew nothing at all about horticulture except what they had learned from their fathers, and the girls were in the same predicament, they knew nothing about domestic science except what they had learned from their mothers. I consider this a great step forward, and we are just at the beginning, we are just having our eyes opened to the necessity of educating students along this line of work.

Annual Report, 1911, Kandiyohi County Horticultural Society.

C. C. SELVIG, SECRETARY, WILLMAR.

The Kandiyohi County Horticultural Society starts out with twenty-five paid up members for the year 1912. This is a good beginning.

Fruits of all sorts that we grow in our county did well this year. Prices in our local markets for good apples were good.

A few of our members are doing a good deal of top-working. P. H. Peterson, of Atwater, has top-worked trees that are bearing. He has Malinda on Hibernal and Virginia, Red Warrior on Virginia, N. W. Greening on Virginia, Scott's Winter on Hibernal and Martha, Jonathan on Siberian Crab and Hibernal, Grimes Golden on Hibernal and Siberian Crab, Famuese on Hibernal, Wealthy on Hibernal and Virginia, Ben Davis on Hibernal, Swartzwood on unknown crab. I have, myself, Wealthy on Hibernal and Virginia, McIntosh Red on Minnesota, Hibernal and Virginia, N. W. Greening on Virginia. The Hibernal and Virginia that I top-work are on own roots and are doing fine and bearing heavily.

Plums were a good crop this year (1911) and sold from $1.50 to $2.00 per bushel.

Our summer meeting in July was well attended and was held at the home of John Wicklund, our president. Prof. K. A. Kirkpatrick was the principal speaker, and his talk made six new members for our society.

Digitized by Google

Secretary's Annual Report, 1911.

A. W. LATHAM, SECRETARY.

The year just closing (1911) has been an especially favorable year for the members of the Horticultural Society, particularly those engaged in growing fruit, although there has been some disappointment in marketing the unexpectedly large crop of apples, brought about generally by lack of experience in packing and placing the fruit upon the market. These disadvantages in commercial fruit growing can be readily corrected by studying the example and following the counsel of those who have worked out successful methods of doing these things.

The society itself has not been quite as prosperous in one direction as usual the past year, having fallen down slightly in numbers, caused undoubtedly by the very poor fruit crop of the year before and the discouraging outlook for amateur horticulturists. The members of the society engaged in commercial horticulture have not been so affected by this temporary condition, but as they are only a comparatively small proportion of the total membership, their loyalty to the society did not affect materially the final result. With the extraordinary fruit crop of this year and the remarkable building up to date of the membership roll for 1912 (the number of annual members being enrolled at this time being more than twice as many as a year ago at this time for 1911), we have every hope of not only equalling but exceeding the membership of 1911 long before the close of the year now opening. Notwithstanding the decrease from this source of revenue the society's finances as a whole show an increase of some $27.00 over and above the total funds on hand at the close of 1910, a condition of things with which the officers of the society may well congratulate themselves.

At the present writing the annual membership for 1911 stands at 2,618. The number of life members is 274, of which number 24 have had their names placed upon the life membership roll during the year past. We have been fortunate in retaining upon this life roll nearly the full list, only five having died during the past year. The following are the names of deceased members: L. E. Austin, Glencoe; R. A. Sodergren, Scandia; C. B. Clark, E. Nagel, Minneapolis; Mrs. H. B. Sargeant, Lake City. The names that have been added to this roll the past year are as follows: E. S. Berrisford, St. Paul; Dr. G. Schmidt, Sleepy Eye; S. P. Crosby, St. Paul; Dewain Cook, Jeffers; A. G. Long, Minneapolis; D. T. Wheaton, Morris; Mrs. Imelda Glaeser, Owatonna; W. S. Weston, Faribault; C. J. Orton, Marietta; T. N. Krier, Farmer, S. D.; A. J. Rood, Spring Grove; Edwin Benson, Jackson; F. C. Fuller, Madison, S. D.; A. A. Schenck, Omaha, Nebr.; Wm. C. Geiger, Chicago, Ill.; Ed. W. Schuster, Charles City, Ia.; Wm. Wendlandt, Owatonna; Geo. H. Warren, Minneapolis; Rev. Jas. W. Anderson, Sidney, Mont.; Geo. W. Harris, McHugh; C. J. Rennacker, Detroit; A. K. Bassett, Baraboo, Wis.; Mrs. B. Jewell, Dalbo; S. H. Drum, Owatonna; Jay F. Lyon, Elkhorn, Wis.; N. O. Skaar, Zumbrota; G. F. Kerns, Fairmont.

Digitized by Google

Of this number as noted above three, Dewain Cook, A. G. Long and D. T. Wheaton, were honorary life members, created by the last annual meeting.

It is entirely proper in this connection that I should analyze the annual membership roll, which is made up in part of auxiliary societies as follows: Minnesota State Forestry Association, 65; Minnesota State Rose Society, now called Minnesota Garden Flower Association, 73; Southern Minnesota Horticultural Society, 47; Kandiyohi County Horticultural Society, 25; Northeastern Minnesota Horticultural Society, 10; Lac Qui Parle County Horticultural Society, 24; Red River Valley Horticultural Society, 2; and North Dakota Horticultural Society, 67. The nurserymen of the state have sent in a considerable number of members, though not in our judgment as many as represents the interests of this class of horticulturists in the society, and we are hopeful that in the immediate future there will be more assistance of this practical character rendered by the nurserymen. Memberships have been recived from them as follows: Jewell Nursery Company, 76; Strand's Nursery, 13; Andrews Nursery, 4; Madison Nursery, 8; Howard Lake Nursery, 4; Clinton Falls Nursery, 2; Luverne Nursery, 7; Battle Lake Nursery, 2.

The farmers' institutes have contributed, as usual, a considerable portion, in fact, nearly all the new members of the society come in through the efforts of the lecturers on horticulture in the farmers' institutes, who distribute the literature of the society and secure these memberships. Though some four institute corps are in the field, only two of them have been regularly represented by horticultural workers. We consider this unfortunate, as every portion of the state is equally interested in the development of fruit growing and equally eager to secure information along these lines, and as the institute corps are now organized there are more horticultural workers in the field, enough, we hope, to include each corps in service. Institute workers of 1911 have sent memberships as follows: R. A. Schutz, Leroy, 254; A. Brackett, Excelsior, 159; F. F. Marshall, Grove City, 34; N. L. Chapman, Minneapolis, 8.

Premium books of various kinds are given to those who secure new members, or as during the past year to new members themselves, and the books used for that purpose are mainly "Amateur Fruit Growing," by the late Prof. S. B. Green, though a few other books are called for from a list noted in the society folder. The exact number of these books distributed is not available without considerable research, but the amount paid for them was $208.71.

Large numbers of the members have taken advantage of the opportunity to secure experiment plants, two selections from a considerable list of which are offered to each member of the society. A larger number of selections were made this year than any year previous, amounting in all to 1,658. As most members made two selections, they went approximately to 829 members.

It may be interesting at this point to note the number of the members of our society belonging to the Plant Breeders' Auxiliary, about 250, many of whom are contestants for the seven $100 prizes offered in connection with the apple seedling contest. Packages of apple seed

Digitized by Google

were sent out to forty of these contestants last year. As the last of these prizes now offered does not mature till 1919, there is still plenty of time to plant seed and bring the trees to fruitage if properly handled. It is desirable that every member situated so he can do so should participate in this interesting contest.

There has been an extraordinary demand for programs for the annual meeting, and the interest at this meeting will emphasize the importance of issuing a large number of them. In all 4,500 have been sent out.

A few additions have been made to the library of valuable books, list of which will be found on page 529 of the report of the society for 1911.

A considerable number of files of reports have been sent to life members this year. These reports are of exceeding value to any one interested in following up the development of fruit growing in our state, and their possession should be a large incentive to annual members to become life members while still the earlier issues of the society are to be secured. A very small number of them are now exhausted, but the great majority can still be had.

No changes have been made in the trial stations during the year past. Considerable trial material was sent out last spring, consisting largely of new varieties of plums and other fruits grown by Prof. N. E. Hansen at the South Dakota Experiment Station. Reports of these stations appearing in an early number of our monthly are commended to your earnest attention.

Death laid its hand upon our list of society vice presidents for 1911, removing from amongst us a valuable member, Mr. L. E. Austin, of Glencoe. The writer had not the pleasure of a personal acquaintance with this member, but knew him well from personal correspondence, and his interest in our work was highly appreciated.

Through the efforts of our president, Thos. E. Cashman, and others, an addition to our printing appropriation of $1,000 was secured from the last state legislature, which should enable us to increase the issue of our reports some five hundred, a number which we believe will prove adequate for our needs for the next two years, especially as there are always quite a number in the society who do not ask for the report. If it were otherwise we should be totally unable to hold any reserve or send out complimentary copies to other horticultural societies and public libraries, as we desire to do. It must be noted, however, that this appropriation is only for two years and will have to be called for again from the state legislature a year from this winter.

We are looking forward to an unusually successful year in 1912, and with the co-operation of our membership, which we are assured will be heartily rendered, there is no reason why we should not continue the steady growth of the society and still remain, as this organization has long been, the leading one of its kind in the country in strength of numbers and purpose, and we believe also in achievement.

The financial statement following will show the finances of the society to be in good condition and very little depleted by the slight falling off in membership the past year.

Digitized by Google

Secretary's Financial Report for 1911.

Receipts of Secretary's Office.

Balance on hand at beginning of year	$168.68
Life membership fees	217.00
Advertising	22.50
Books sold	76.93
Banquet tickets sold	123.00
Apple seed sold	5.90
Gideon Memorial Fund	4.00
State Agricultural Society	5.00
Interest on money in Security Bank	120.00
Drawn from deposit in Hennepin County Savings Bank	500.00
Rose society for premiums at summer meeting	50.00
Cuts sold	9.08
Rebate postage on magazines	65.67
Annual membership fees, 1910	2.00
Annual membership fees, 1911	2,442.00
Annual membership fees, 1912	375.00
Sundries	3.61
	$4,190.37

Expenses of Secretary's Office.

Postage	$769.58
Express	26.24
Expenses annual meeting, 1909	18.00
Expenses annual meeting, 1910	331.30
Expenses annual meeting, 1911	41.81
Expenses summer meeting, 1911	9.90
Expenses trial stations	123.30
Expenses vice presidents	37.18
Expenses executive board	16.14
Discounts, annual membership fees, 1911	399.35
Printing	227.90
Office supplies	43.34
Insurance	8.00
Reporting annual meeting, 1910	222.00
Examining books	10.00
Books for library	43.14
Plant premiums	2.31
Banquet	169.00
Office rent	350.00
Premium books	208.71
Officers' bonds	18.00
Assistance in office	542.75
Gas and telephone	58.05
Expenses of delegates	56.88
Printing Minnesota Forester	41.57
President's and treasurer's salaries, 1910	50.00

Digitized by Google

Sundries	39.16
Balance on hand at close of year	326.76
	$4,190.37

GENERAL FINANCIAL STATEMENT AT CLOSE OF 1911.

Balance in Hennepin County Savings Bank at close of year, 1910	$1,957.25
Interest to date	61.45
	$2,018.70
Drawn out in 1911	500.00
Balance in Hennepin County Bank	$1,518.70
Loring Fund	117.33
Balance in society treasury	4,663.70
Balance with secretary	326.76
	$6,626.49

Annual Report of Treasurer, 1911.

GEO. W. STRAND, TREASURER, TAYLORS FALLS.

RECEIPTS.

1910	Dec. 10, balance on hand	$4,356.45
	Dec. 10, A. W. Latham, receipts of secretary office, June 14 to Dec. 1	796.41
1911	Feb. 17, state treasurer, semi-annual allowance	1,250.00
	June 14, A. W. Latham, receipts of secretary's office, Dec. 1, 1910, to June 6, 1911	2,839.12
	Aug. 18, state treasurer, semi-annual allowance	1,250.00
		$10,491.98

DISBURSEMENTS.

1910	Dec. 10, order 190, A. W. Latham, expenses of secretary's office, June 14, 1910, to Dec. 1, 1910		$796.41
1911	March 3, order 191, A. W. Latham, first quar. salary		450.00
	June 1, order 192, A. W. Latham, second quar. salary		450.00
	June 14, order 193, A. W. Latham, expenses of secretary's office, Dec. 1, 1910, to June 6, 1911		2,839.12
	June 14, order 192½, premiums, winter meeting 1910		218.75
	Sept. 1, order 194, A. W. Latham, third quar. salary		450.00
	Dec. 1, order 195, A. W. Latham, fourth quar. salary		450.00
	Dec. 1, order 196, premiums, summer meeting, 1911		149.00
	Dec. 1, order 197, Geo. W. Strand, treas. salary, 1911		25.00
Balance:	Security Nat. Bank, certificate of dep.	$4,500.00	
	Security Nat. Bank, open deposit	163.70	
			4,663.70
			$10,491.98

Digitized by Google

Records of Executive Board for 1912.

Record of meeting of Executive Board held in the office of the secretary at 8:00 p. m., December 4, 1911.

All members of the board were in attendance.

The bill of the treasurer for premiums paid at the summer meeting 1911 was approved amounting to $149.00 and an order drawn.

The accounts of the secretary for amount of expenditures of the secretary's office from June 6, 1911, to Nov. 29, 1911, were examined and approved and an order drawn for the amount, $121.07.

Adjourned sine die.

WYMAN ELLIOT,
Chairman Executive Board.

A. W. LATHAM, Sec'y.

Record of meeting of Executive Board held in the Unitarian Church at 4:00 p. m., December 7, 1911.

All members of the board were in attendance. Mr. Wyman Elliot was elected chairman of the board, and A. W. Latham secretary of the society for 1912.

The salary of the treasurer was fixed at $25.00 per annum and that of the secretary $1,800.00 per annum.

The following resolution was unanimously adopted:

"Resolved by the Executive Board of the Minnesota State Horticultural Society:

"First: Horticulture, and especially fruit growing, being still an undeveloped industry in this state, where so many problems connected with it must still be worked out, we believe that the general interests of the people of Minnesota demand that a lecturer on horticulture accompany each institute corps in operation in the state.

"Second: The state having gone to large expense in the preparation of suitable material, in the form of annual and monthly reports by the State Horticultural Society, which should by all means be placed in the hands of those who need them and appreciate their need, we believe it entirely proper that this distribution should be made at the farmers' institutes, also supported by the state, and that for the accomplishment of this purpose a suitable time should be allowed for the presentation of this matter from the institute platform by the horticultural lecturer connected with the institute corps.

Digitized by Google

"Third: We believe a proper distribution of this material could best be made by placing it in the hands of those who have sufficient interest in the subject to pay a membership fee in this society, and as a general rule not otherwise.

"Fourth: In our judgment there is no objection to the presentation at the institutes of the interests of one or more societies supported by the state if there are members of the institute corps present who desire to make such presentation. It seems to us eminently a proper place for such service and the best means possible of reaching the very people who should be connected with and assist in supporting such organizations.

"Resolved, That a copy of these resolutions be placed in the hands of the Superintendent of the Minnesota Farmers' Institutes."

Adjourned sine die.

WYMAN ELLIOT,
Chairman Executive Board.

A. W. LATHAM, Sec'y.

Record of meeting held in the office of the secretary, 8 p. m., Thursday, June 13, 1912.

There were present at this meeting the following members: Wyman Elliot, Thos. E. Cashman, Clarence Wedge, Prof. LeRoy Cady, and A. W. Latham.

The secretary's annual account of expenditures of his office from Nov. 29, 1911, to June 7, 1912, were examined and an order authorized to be drawn on the treasurer for the amount, Three Thousand, Two Hundred Fifty and Twenty-Six One-hundredths Dollars ($3,250.26), the same amount from the receipts of the secretary's office during that period to be deposited with the treasurer.

The account of Geo. W. Strand, Treasurer, for the payment of premiums awarded at the winter meeting of 1911 for $287.77, was audited and allowed, and an order authorized to be drawn on the treasurer for that amount.

A committee consisting of Thos. E. Cashman, Clarence Wedge, and A. W. Latham was appointed to present to the Farmers' Institute Board the matter of presentation at the Farmers' Institutes of the interests of the Horticultural Society if in their judgment it seemed wise to do so, and at the same time the resolution adopted at the meeting of the board, Dec. 7, 1911, be placed in the hands of the members of the Farmers' Institute Board by such committee.

Adjourned sine die

WYMAN ELLIOT,
Chairman Executive Board.

A. W. LATHAM, Sec'y.

Digitized by Google

Annual Report, 1911, Minn. Garden Flower Society.

MRS. E. W. GOULD, SECRETARY, MINNEAPOLIS.

Our little floral society, which was organized in 1904, has become a flourishing seven year old youngster, and, as is proper with such, is still growing.

This last year we have held three most helpful meetings, at each of which we have interested and secured new members to help us in our work of making the world more beautiful.

Our eighth floral show was held at the Experimental Station, St. Anthony Park, with the Horticultural Society, and each year we appreciate more not only the advantage of this co-operation, but also the extreme helpfulness and courtesy shown us by its officers and members, and by the faculty at the station. Everything possible was done for our aid and comfort, the result being a beautiful exhibit in commodious quarters, enjoyed by flower lovers from far and near.

The beautiful and extensive exhibit of flowers in the amateur class at the state fair this year (1911) was made almost without exception by our members, and several of these exhibited with the professionals. We realize each year more and more the value of this special exhibit, as many of the visitors stop and question us as to the names of the flowers, how to grow them, and where to get them. And so, each year, our gospel of beauty spreads a little further.

During the year it has become necessary, in order to remain members of the State Agricultural Society, to change our name to one more general in its meaning, and expressing more clearly, perhaps, the breadth of our work. The name chosen and adopted was "The Minnesota Garden Flower Society," and as such we hope to extend further and further its aim of gathering and distributing knowledge relating to the practical growing of trees, shrubs and garden flowers, hoping in time to have members and branches in every town and hamlet in our beloved state.

Every one interested in flowers and what they really stand for, beauty in the home (and in the heart), is invited to join us.

Digitized by Google

MEMBERSHIP, 1912.

Annual Members.

Aamodt, A. W....857 Albemarle St., St. Paul
Abel, Nick .....Evansville
Abbott, Geo. .....Newport
Ackermann, A. W. .....Young America
Achatz, Joseph .....Harmony
Ademmer, B., Jr.....New Prague
Adams, R. H. .....Magnolia
Afdem, M. P. .....Blooming Prairie
Agnew, R. J. .....Long Lake
Ahlstrom, John.....Spicer
Ahsenmacher, H. J.....Ward, S. D.
Aiton, Geo. B.....1601 Univ. Av., Mpls.
Akenson, H. E.....Red Wing
Akin, R. W.....Anoka
Alexander, Alfred.....Dawson
Almquist, C. A.....Capas
Alme, O. T.....Ulen
Algren, John.....Hasty
Allen, Edgar.....New Auburn
Allarson, H.....Winthrop
Albright, And.....La Crescent
Aleshire, Will .....Long Prairie
Allan, M. E.....Aitkin
Allard, Henry ....318 Central Ave., Crookston
Alsterberg, H., 770 W. Van Buren St., St. Paul
Amble, A.....Adams
Andrews, J. P.....Faribault
Anderson, Louis .....Gladstone, R. 1
Anderson, J. C. B.....
.....1285 Portland Ave., St. Paul
Anderson, J. A.....Rollag
Anderson, Clarence .....Lake City
Anderson, V. C.....Sta. F., R. 3, Mpls.
Anderson, Miss Deborah.....
.....627 E. 17th St., Mpls.
Anderson, Alex. P.....
.....5558 Everett Ave., Chicago, Ill.
Andrews, Gen. C. C..... Capitol, St. Paul
Anderson, Emil.....5235 Upton So., Mpls.
Anderson, H. M.....Moose Lake
Andrew, Harry .....5327 So. Lyndale, Mpls.
Anderson, M. S.....Jackson
Anderson, Fritz N.....Cannon Falls
Andrews, W. A.....Walhalla, N. D.
Ananby, John C.....Kenyon
Anderson, A.....
.....2359 Chilcombe Ave., St. Paul Park
Anderson, J. A.....Canby, Box 785
Anderson, Claus .....617 York St., St. Paul
Anderson, Richard .....Northfield, R. 4
Anderson, Louis .....Duluth, R. 1
Anderson, Albin .....Excelsior
Anderson, Gust .....Cedar
Anderson, B. E.....Mabel, R. 1, Box 99
Anderson, J. E.....Hector, R. 5, Box 35
Anderson, A. G.....Round Lake, Box 87
Anderson, Walter .....Badger
Anderson, Frank C.....Litchfield
Anderson, E. N.....210 5th St., Red Wing
Anderson, Nels.....St. Peter
Anderson, Nels.....Windom
Anderson, Julius O.....Bird Island
Anderson, E. M.....Kimball, R. 1, Box 164
Anderson, Harold W.....
.....355 E. Cook St., St. Paul
Anderson, J. C.....Thief River Falls
Anderson, J. A.....Lafayette, R. 1, Box 17
Apenhorst, Benj.....Preston
Armitage, C. W.....Canby
Armstrong, H. R.....Chatfield
Arrowood, Jas.....Nevis
Armstrong, O. V.....Appleton
Arnts, W.....Jordan
Armstrong, Frank .....Fondulac

Arndt, Julius .....Lewisville
Arneson, Martin .....Newport
Aschbach, Bernh.....Ada
Ashby, H. M. 601 Canal Road, Cleveland, Ohio
Ash, P. J.....Warroad
Ashcroft, E. L.....White Bear
Atkins, E. C. & Co.....Indianapolis, Ind.
Aune, Martin .....Starbuck
Aune, Olaf .....Underwood
Austin, Miss Mary J.....
.....503 Sellwood Bldg., Duluth
Austin, O. A.....Mac Ville, N. D.
Austad, Carl .....Lemmon, S. D.
Austin, Mrs. C. D..3245 3rd. Ave. So., Mpls.
Austerheim, Sigurd.....Albert Lea
Averill, F. A.....Excelsior
Avery, Carlos .....Hutchinson
Avery, T. A.....Fort Ransom, N. D.
Axlness, Julius .....Milroy
Ayers, H. B.....Aitkin

Badrann, Peter .....Harvey, N. D.
Baird, Rev. And. B.....
.....247 Colony St., Winnipeg, Man.
Bailey, J. Vincent .....Newport
Bailiff, C. E.....Sta. F, R. 1, Mpls.
Baalson, H. E. .....Brooten
Baalson, A. E.....Brooten
Baglien, Hans H.....Rothsay
Backus, Mrs. C. J. 580 Holly Ave., St. Paul
Bailiff, C. E.....Sta. F, R. 1, Mpls.
Bailey, Mrs. W. C. 1023 17th Ave. S. E., Mpls.
Bacon, L. T.....Mabel
Baird, L. D.....Austin
Baasen, Albert .....Wendell
Bain, R. J.....Utica
Baldwin, H. J.....Northfield
Baker, H. F..4629 Lake Harriet Boul., Mpls.
Balgaard, Jos.....Ashby
Baldwin, A. N..238 E. Litchfield Av., Willmar
Baker, E.....886 Dayton Ave., St. Paul
Baldwin, A. M.....River Falls, Wis.
Bakklund, C. A.....Willmar
Baner, Jos. H.....Perham
Bandler, Geo.....Austin
Bannell, E. S.....Heron Lake
Bauman, L. B.....Heron Lake
Ball, Joseph.....Crookston
Bakke, J. E.....Detroit
Bakke, Dr. O. H. 1811 13th Ave. So., Mpls.
Baker, Mrs. B. E.....6009 Tiogo St., Duluth
Baney, J. W.....Blackduck
Baldwin, Miss L. O..707 Cham. of Com. Mpls.
Barton, Mrs. Isabella, 187 E. Mechanic St.,
.....Shelbyville, Ind.
Bartram, Mrs. C. S..1999 Iglehart St., St. Paul
Barclay, J. M.....Madison Lake
Barton, Henry .....Davidson, Sask.
Barnes, J. U.....705 Oneida Bldg., Mpls.
Barth, L. L.....
....care Ed. Hines Lbr. Co. Chicago, Ill.
Barnard, A. H.....Wayzata
Barott, J. E.....Tamarack
Bartlett, Mrs. E. E.....Delano
Barton, Geo., Jr.....Wabasha
Barton, C. A.....Northland Pine Co., Mpls.
Barickman, Daniel .....Lewisville
Barkes, Herman .....Sleepy Eye
Barsloux, F. E.....Argyle
Barth, Frank .....Aitkin
Barrows, Mrs. F. L.....
.....12 N. 19th Av. E., Duluth
Barton, Bert .....Republic, Mich.

Digitized by Google

Bates, W. K.....Stockton
Bates, A. N.....Excelsior
Batho, Geo.....406 Maryland St., Winnipeg, Man.
Baxter, Hector.. .....4200 Park Blvd., Mpls.
Bauman, Wm.....Delano
Baumgartner, Joe .....Robbinsdale
Bates, Wm. H..... Excelsior, R. 1
Baumgartner, Wm. .....Fergus Falls
Baum, Gus .....Coleraine, Box 164
Bassett, Mrs. H. S.....Preston
Batson, S. W.....R. 3, Wayzata
Bazille, E. W.....Court House, St. Paul
Batdorf, Niles.....Maple Plain
Bauman, F. J.....724 Central Ave., St. Paul
Beach, Wesley .....Excelsior
Bell, F. W.....2532 Nic. Ave., Mpls.
Becker, E. W.....Excelsior
Becker, J. C.....Adrian
Beardmore, H. J.....Warren
Bell, F. S.....Winona
Beaudoin, Louis.....St. John, N. D.
Beissel, Peter.....Delano
Beard, F. W.....Dauphin, Man.
Beard, Dr. R. O.....1775 Hennepin Av., Mpls.
Belden, C. D.....Austin
Beatty, L. R.....Cook
Bell, C. R.....Grand Rapids
Beattie, John .....Dawson
Beckstrom, J. A.....1108 Jessie St., St. Paul
Beaver, H. M.....Lake Park
Benjamin, J. F.....Hutchinson
Berger, Geo.....Arlington
Berry, Frank .....Stillwater
Benhardus, Martin.....Battle Lake
Bentley, Mrs. Annie.....Twin Valley
Berg, I. I.....Climax
Berthelsen, Christ.....Albert Lea
Bendel, M., Sr.....Madison
Berset, Nels A.....Kerrick
Benson, W. R.....Long Lake
Berglund, Robt.....Kensington
Bender, John .....Chaska
Berg, H. S.....Clarkfield
Bergeland, P. T. O.....Dawson
Benson, A. O..Forest Service, Missoula, Mont.
Berntson, B. Olgot .....Bagley
Benton, Henry W.....Sec. Bk. Bldg., Mpls.
Benham, D. B.....Hopkins, R. 1
Berns, Mrs. Jacob .....Perham
Berneck, Aug. F.....Delano
Bartholomew, C. C....1307 Minn. Av., Duluth
Berkman, C. E.....Badger
Bentzen, M. H.....2210 Riverside Av., Mpls.
Bennett, Thomas .....Fairmont
Bennett, J. W.....Dispatch Bldg., St. Paul
Berg, Mrs. Albert .....Spooner
Bethke, H.....Franklin
Betz, F. A.....Boyd
Bessette, F. W.....Orr
Bevier, J. A.....Westbrook
Bisbee, John .....Madelia
Biermann, Henry .....Glencoe
Biron, Robt. H.....Court House, Mpls.
Bixby, J. S.....Richville
Bigelow, E. E.....Owatonna
Binnie, James.....Sauk Rapids
Bircher, Wm.....661 Ohio St., St. Paul
Birkett, Miles .....Ellsworth
Bixby, H. N.....Richville
Bjornberg, G. J.....Willmar
Bjorndahl, N. N.....Hawley
Blaker, Rev. C. D.....Spencer, Ia.
Bluhm, Otto .....Deer Creek
Blakestad, L.....Lyle
Blackmore, Hon. Jno. C..140 Ollivers Rd., ...Linwood, Christ Church, N. Z.
Bluhm, A. G.....Le Sueur
Blessing, David S..... .....4 N. Court St., Harrisburg, Pa.
Black, G. D.....Independence, Ia.
Bloomquist, Ole .....Svea
Block, Geo. W.....Thompson, N. D.
Blymeyer, S. F. G.....217 3rd St. S., Mpls.
Bloomfield, Prof. L. M.....Hinckley
Blom, F. W.....2718 15th Av. So., Mpls.
Blomberg, Fred .....Deerwood
Blain, Geo. A.....Casperson
Blumenrader, C. F.....Waterville
Bloomer, C.....Morristown
Bosshard, Herman .....Moorhead
Boardman, Mrs. H. A..... .....1336 River Blvd., St. Paul
Bollmann, Paul .....Balaton
Boline, J. A.....Clarissa
Boelk, Ferd .....Lansing
Boettcher, Rev. H.....Gibbon
Bock, John .....Wabasso
Born, Otto G..... .....674 Manomin Av., St. Paul
Bongie, Louis ....Bradley St. Sta., St. Paul
Borth, Frank H.....Fairfax
Bofferding, W. H.....1423 N. Emerson, Mpls.
Bonde, Peter .....Willmar
Boeglin, Louis ....Park Greenhouses, 38th & Bryant, Mpls.
Bossen, C. A.....4020 Bryant So., Mpls.
Borland, Robt.....Excelsior
Boardman, Vern.....Stanley, Wis., R. 2
Bohnsack, Phillip .....Grandin, N. D.
Boehner, Carl.....4949 Columbus, Av., Mpls.
Bondhus, Herman O.....Storden
Borup, E.....Dent
Borgmann, V. W.....Mayer
Bowman, Dr. F. C. 119 6th Av. W., Duluth
Boyle, M. S.....Adrian
Boucher, Geo. J.....Amiret
Boyington, Mrs. Rebecca P..Lakeside, Duluth
Bove, Peter .....Sta. F, R. 4, Mpls.
Boyd, J. B.....Willmar
Boughner, L. J.....954 Plymouth, Mpls.
Bowlin, Frank J....145 E. 5th St., St. Paul
Bowers, Geo.....Crosby
Boutwell, E. E.....Kasota
Boulis, Lewis.....Anoka, R. 5
Brandt, P. C.....Morris
Brandt, P. A.....Erskine
Brander, J. M.....Sauris, N. D.
Brand, A. M.....Faribault
Braeht, Albert .....Foley
Braberz, C. W.....Dassel
Brevig, A. L.....Starbuck
Briggs, H. W.....Sanborn
Brewer, W. W.....Orisko, N. D.
Briggs, Geo. A.....Traverse
Breen, Frcd .....City Hall, St. Paul
Bremer, John .....Lake City
Bringmeier, Fred J.....Cass Lake
Brevig, C. L.....Starbuck
Bredvold, Martin .....Springfield
Brentson, Simon .....Janesville
Bricker, S. U.....76 N. 15th St., Mpls.
Bremer, Leslie.....Cannon Falls
Briggs, Paul .....793 Fairmount Av., St. Paul
Brewster, D. R..... .....Forest Service, Priest River, Idaho
Briggs, H. B.....Aitkin
Brush, G. H. R.....Owatonna
Brown, A. D.....Baraboo, Wis.
Brown, Frank .....Paynesville
Brown, Mrs. G. T..735 Hague Av., St. Paul
Broberg, Peter .....New London
Broman, Aug.....Atwater
Brunkow, Chas A.....Delano
Brown, Aug.....Winthrop
Broden, Gust A.....Murdock
Brown, H. A.....Brownsdale
Brown, J. P.....3204 22nd Av. S., Mpls.
Brown, O. .....22 S. 6th St., Mpls.
Brown, John A.....Windom
Brummer, Henry W.....Renville
Bruns, Henry .....Excelsior
Brown, Mrs. J. F.....2412 Garfield, Mpls.
Brown, E. S.....Fisher, R. 2

Digitized by Google

Brooks, W. W.....Long Prairie
Broman, Chas.....Willmar
Broome, J. M.....Mankato, 416 Byron
Brown, Jas. A.....
.....125 Vernon Av. W., Fergus Falls
Brown, Fred C.....Cedar
Broden, Mrs. C. E....4927 Dupont So., Mpls.
Brooks, W. F..Backus Brooks Lbr. Co., Mpls.
Bronson, J. D.....Stillwater
Brustad, O. J.....Fosston
Bryan, A. C.....Red Wing, R. 3
Bruss, A. E.....Echo
Bugbie, A. E.....Paynesville
Bunnell, M. C.....Newport
Bull, Prof. C. P.....St. Anthony Park
Buchanan, D. W.....St. Charles, Man.
Buback, Chas.....Olivia
Buetow, P.....Belle Plaine
Bunning, Otto .....Round Lake
Bunning, Hans, Jr.....Round Lake
Buhler, E. O.....Thief River Falls
Bullock, Elmer .....Richville
Bunn, T. H.....Pine Island
Buro, John .....Cook
Burrows, Walter .....Delano
Burfield, Geo. E.....Shevlin
Burlingame, Florence .....Grand Rapids
Burkee, John A.....Badger
Burke, John .....Waterville
Burbank, J. M.....St. Paul Park
Butterfield, F. J.....Long Lake
Butterfield, Mrs. F. J.....Long Lake
Butler, G.....Mabel
Butts, F. C.....2805 Fremont So., Mpls.
Butler, Miss Eloise..4748 Chicago Av., Mpls.
Busse, W. E.....Dundee
Bruss, G. J.....Lindstrom
Brunes, Aug.....Nisswa

Cairns, Miss Gertrude M.....Ellsworth, Wis.
Cant, Mrs. W. A.....Duluth
Canby School .....Canby
Campbell, E. R.....Minn. Transfer, St. Paul
Calahan, H. E....U. S. Army Bldg., St. Paul
Cantien, D. S.....Walnut Grove
Campbell, J. A.....Cloquet
Carlson, C. H.....Fertile
Carruthers, J. T.....Willmar
Carlson, And.....Grandy
Carlsen, Alfred .....Grantsburg, Wis.
Carpenter, M. B....Hotel Aberdeen, St. Paul
Carey, Geo. W.....Lidgerwood, N. D.
Carlson, C. W.....Maple Plain
Carleton, Frank H.....600 N. Y. Life, Mpls.
Carpenter, Paul .....St. Peter
Cary, Prof. Austin.....U. Farm, St. Paul
Carpenter, F. H....121 West Franklin, Mpls.
Carpenter, A. C.....Richville
Carlson, Alfred.....Kimball, R. 3
Carter, Sam V.....Swea City, Ia.
Carlson, David.....925 Payne Av., St Paul
Catlin, T. J., M. D.....Palisade
Catlin, Mrs. Chas. P..212 12th Av. E., Duluth
Casey, R. F.....Detroit
Central Lumber Co.....Hudson, Wis.
Cedergren, E. A.....Lindstrom
Chatfield, Mrs. L. M.....
..... 1067 15th Av. S. E., Mpls.
Chamberlain, Mrs. L. M....Sta. F, R. 3, Mpls.
Chandonnet, Rev. Z. L.....Perham
Chase, O. C.....Fergus Falls
Charlson, S.....Dennison
Chapman, H. H.....
..Yale Forest School, New Haven, Conn.
Chandler, A. P.....Fargo, N. D.
Chancellor, Fred F.....Hutchinson
Chamberlain, V. M.....Racine
Chappell, E. E.....Ely
Chalberg, Chas.....Kandiyohi
Chapman, C. P.....Dent
Chaser, J. P.....Celina
Champlain, M. H.....Dent

Chatfield, Mrs. E. C..4736 Emerson N., Mpls.
Christopherson, Nels.....Hoffman
Cheney, W. H.....Olivia
Christianson, P. A.....Hinckley
Christopherson, K. S.....Zumbrota
Christiansen, H. C.....Oshkosh, Wis.
Chinberg, C. A.....Hankinson, N. D.
Church, B. C.....Wrenshall
Chisholm, R. G.....Palace Bldg., Mpls.
Childs, H. S.....1102 Lbr. Ex., Mpls.
Christ, Anton .....Leal, N. D.
Christenson, J. B.....Milroy
Christenson, N. E.....Litchfield
Christopherson, Chris ..Camden Place, Mpls.
Church, F. E..care Northern Shoe Co., Duluth
Cheyney, Prof. E. G.....U. Farm, St. Paul
Cherney, J. W.....
....Winslow and Arion Sts. W., St. Paul
Christenson, Wallie .....Forest Lake
Ciezinski, A. M.....Owatonna
Clemons, L. A.....Storm Lake, Ia.
Clarkson, S. F.....St. Charles
Clausen, P.....Albert Lea
Clingman, Frank .....Austin
Clinton, Nic.....Watkins
Cleator, Frederick W.....
.....Forest Service, Republic, Wash.
Cleveland, Henry .....City Hall, Duluth
Clement, W. A.....Waseca
Clark, Geo.....Sarles, N. D.
Cleator, W. P.....1601 Fremont No., Mpls.
Clark, W. W.....424 Plymouth Av., Mpls.
Clark, J. M.....Stewartville
Clements, Fred E.....Univ. of Minn., Mpls.
Clark, Mrs. A. Y.....Box 237, White Bear
Collins, P. V.....N. W. Agri., Mpls
Colling, Jas. H.....Inkster, N. D.
Conrad, John.....Ortonville
Coffin, W. F.....Homer
Colburn, G. B.....St. Cloud, R. 6
Comstock, A. J.....Rochester
Comstock, E. F.....1134 Jefferson St., Mpls.
Collins, L. W.....942 Sec. Bk. Bldg., Mpls.
Converse, T. R.....Stillwater
Colvin, Mrs. A. R.....Davern Av., St. Paul
Constance, Wm.....Hopkins
Coffin, B. F.....Lyndale Sta., Mpls.
Conner, E. M.....4429 Vincent So., Mpls.
Coffin, H. W.....610 Sellwood Bldg., Duluth
Conklin, R. S..State Capitol, Harrisburg, Pa.
Coburn, C. F.....Fulda
Consolidated School .....Doran
Colyer, Mrs. F. H.....Olivia
Corson, Chas. V.....Glencoe
Cook, A. D.....225 Kasota Blk., Mpls
Cooley, Eugene .....Morristown
Corson, Mrs. F. E.....
.....3321 Bloomington Av., Mpls.
Coombs, Jos.....3551 Park Av., Mpls.
Cook, C. R.....Hopkins, R. 3
Cook, C. F.....Austin
Coprs, E. J.....Westbrook
Cowles, F. J.....West Concord
Cox, W. T.....State Forester, St. Paul
Coultes, R. W.....Worthington
Cowen, E.....Whitefish, Mont.
Coss, L. E.....Luverne
Cote, L.....Grasston
Coy, Sherman L.....Cloquet
Covington, Thos. E. 1915 Hennepin Av., Mpls.
Countryman, A. D.....Appleton
Cowing, J. B.....
..3412 Scott Terrace, Morningside, Mpls.
Countryman, Mrs. M. L.....
.....213 So. Avon St., St. Paul
Crassweller, Arthur .....Duluth
Crawford, W. M.....Wahpeton, N. D.
Cramer, Fred.....Mapleton
Cram, M. M.....Mankato, R. 6
Crafts, Dr. L. M.....610 5th St. S. E., Mpls.
Craig, F. M.....St. James
Crandall, Wm.....4412 Grimes Av., Mpls

Digitized by Google

Cram, Chas. ..... Wilkinson
Crane, R. E. ..... Grand Meadow
Crane, P. B. ..... Long Lake
Craig, C. P. ..... Duluth
Crafts, Robt. H. ..... Mound
Crandall Bros. ..... Mankato, R. 1
Crane, W. I. ..... Norway Beach, Cass Lake
Craig, Geo. H. ..... 1812 W. 3rd St., Duluth
Cross, Mrs. E. ..... Sauk Rapids
Crosby, Geo. H. ..... Cowley, Wyo.
Crowe, W. H. ..... Osakis
Crowell, Dr. I. G. ..... Shell Lake, Wis.
Cuzner, E. A. ..... Univ. Av. and 13th S. E., Mpls.
Cummings, Albert ..... Fairfax
Cutting, S. ..... Carnegie, Man.
Cummings, Geo. W. ..... Sta. F, R. 3, Mpls.
Cutting, Frank H. ..... City Hall, Duluth
Currie, W. A. ..... Maple Plain, R. 3
Custer, C. C. ..... Cokato
Culver, E. ..... Sta. F, R. 2, Mpls
Culbertson, Geo. ..... Stewartville
Cummings, Chas. ..... Sleepy Eye
Cummings, James ..... East Grand Forks
Cutler, H. W. ..... Park Rapids
Czanstkowski, Albert ..... Delano

Dahl, Louis D. ..... Atwater
Dahlheimer, Val. ..... St. Michael
Dahlen, O. E. ..... Albert Lea
Dahl, F. A. ..... Chisago City
Danielson, John W. ..... Olivia
Danielson, Solomon ..... Rothsay
Dale, O. G. ..... Madison
Dahlstrom, John F. .2225 30th Ave., So., Mpls.
Damschen, Henry ..... Pelican Rapids
Dahl, A. E. ..... Atwater
Dalzell, Edgar ..... Ogden Apts., Mpls.
Daine, H. W. ..... Arago
Dale, J. B. A. ..... McIntosh
Day, Stephen H. ..... Northfield
Day, F. L. ..... Detroit
Day, L. E. ..... Clinton Falls
Davison, A. H. .State House, Des Moines, Iowa
Davis, Even. J. ..... Glendora, Cal.
Darling, Dr. C. H. ..... 697 Endicott Arcade, St. Paul
Davis, Thos. J. .....1601 London Rd., Duluth
Davies, D. E. ..... Lake Crystal
Davis, L. O. .....3103 Irving N., Mpls.
Davis, L. G. ..... Sleepy Eye
Davis, H. D. ..... Madison
Davis, Mrs. L. M. .....3103 Irving N., Mpls.
Davies, Wm. E. ..... Sparta, Wis., R. 2
Davis, A. R. ..... St. Peter
Davis, S. H. ..... Doran
Darrell, Chas. H. ..... La Prairie
Davidson, Mrs. Bertha ....1020 Central Ave., Great Falls, Mont.
Deline, W. F. ..... Cannon Falls
Decker, J. S. ..... Austin
DeMars, G. J. ..... Fertile
Deary, Wm. ..... Potlach, Idaho
Deline, F. W. ..... Leader
Decker, C. H. ..... Austin
Derickson, G. P. .....1760 Hen. Ave., Mpls.
DeSmidt, A. A. ..... Battle Lake
Destad, O. O. ..... Hayfield
Dewey, L. R. ..... Monticello
Deuel, Harry J. ....Box 274, White Bear Lake
Desmond, W. .....3501 Portland Ave., Mpls.
Dey, R. C. ..... Palouse Falls, Wash.
Denney, Mrs. W. ..... Buffalo
DePuy, A. C. ..... Park Rapids
DeVoist, P. L. .....10-12 Ave., E., Duluth
Detwiler, S. B. .....Morris Bldg., Philadelphia
Dickman, E. J. ..... West St. Paul, R. 2
Diethelm, M. ..... Victoria
Dittbenner, R. C. ..... Sleepy Eye
Dickson, W. A. ..... Almena, Wis.
Dickinson, W. E. ..... Osage, Ia., R. 1
Dickinson, W. C. ..... Osseo
Digness, Martin ..... Weaver, N. D.
Dixon, Jas. K. ..... No. St. Paul, Box 6
Diehn, F. ..... Round Lake
Dittmer, F. M. ..... Augusta, Wis.
District Forester ..... Missoula, Mont.
Dickinson, W. A. .Meadowlands, St. Louis Co.
Dill, John. .....519 Edmond St., St. Paul
Dille, F. G. ..... Hill City
Dille, Peter O. ..... Dassel
Dodds, J. E. ..... Wheaton
Doepping, Wm. ..... Claremont
Dobbin, J. J. ..... Excelsior
Doll, P. J. ..... Nicollet Island, Mpls.
Doerfler, Henry ..... Mpls., R. F. D.
Dockham, A. T. ..... Eagle Bend
Dohlman, Thomas ..... Excelsior
Dodge, Clayton J. ..... Moose Lake
Dols, John ..... Jordan
Dols, John B. ..... Jordan
Dodds, Geo. H. ..... Winona
Doyle, John ..... Prior Lake, R. 1
Dowling, Michael H. ..... Care Greysolon Farms, Duluth
Doring, Rev. F. M. ..... Rogers
Dowler, M. A. ..... Fort Williams, Ont.
Downey, D. ..... Fulda
Dotseth, Alfred ..... Clarkfield
Dougherty, John A. ..... White Bear
Drake, Mrs. H. A. .435 Portland Ave., St. Paul
Drake, N. E. ..... Ruthton
Drisko, Mrs. E. M. .....3913 Garfield, Mpls.
Durand, Albert ..... Waseca
Dunn, John W. G. .1038 Lincoln Ave., St. Paul
Dunn, W. W. .....397 Bates Ave., St. Paul
Durrell, J. J. ..... Bigfork
Dubbels, Joe ..... Lincoln
Dunlop, Mrs. G. K. ..... Long Lake
Dunn, Chas. E. ..... Harmony
Dundass, Dave ..... Argyle
Dunn, W. W., Jr. .502 Partridge St., St. Paul
Duncan, Chas. A. .....2215 E. 2nd St., Duluth
Dunlap, W. H. ..... Hillsboro, N. D.
Dvorak, Aug. ..... Glencoe
Dybvig, N. H. ..... Colton, S. D.
Dybdal, Toston ..... Elbow Lake
Dykeman, E. L. ..... Stephen
Dyar, C. H. .....2824 10th Ave. So., Mpls.
Dyar, E. M. .....1916 Hen. Ave., Mpls.
Dysinger, S. D. .....727 Grand Ave., St. Paul
Dynes, John. ..... Gardner, N. D.
Dryer, Mrs. R. C. ....1927 60th Av. E., Duluth

Eastgate, J. E. ..... Larimore, N. D.
Eaton, V. W. ..... Perham
Earle, C. E. ..... Park Rapids
Earhart, Miss Frances, Public Library, Duluth
Ebert, John F. .....Tony, Wis., R. 1, Box 5
Eberhart, A. L. ..... Austin
Eckman, E. M. ..... Hendrum
Eckhart, O. R. .....87 E. 5th St., St. Paul
Edlund, E. ..... Detroit
Eddy, C. T. ..... Willmar, R. 4
Edmonds, Frank N. ....2919 W. 40th St., Mpls.
Edstran, Elder ..... Elbow Lake
Ells, R. C. ..... Grasston
Effertz, Peter ..... Norwood
Egnell, A. ..... Howard Lake
Eggen, O. C. ..... Effington, S. D.
Eggen, Th. .....3213 Harriet Ave., Mpls.
Egan, Mrs. Geo. ..... Savage
Eickmeier, H. L. ..... Pipestone
Eickmeier, W. A. ..... Pipestone
Eisenach, Walter. ..... Aitkin
Eklund, P. A. ..... Willmar
Ellison, F. H. .....Linden Hills, R. 2, Mpls.
Elliot, W. J. ..... St. Michael
Ellingson, S. ..... Sta. F, R. 4, Mpls.
Elfstrum, Axel F. ..... Willmar
Elstrom, F. O. ..... Atwater
Ellingson, A. D. ..... Bricelyn
Ellison, Mrs. E. J. .....Linden Hills, R. 2
Elliot, Stewart ..... Maple Plain

Digitized by Google

Elwell, L. A.....Montevideo
Elofson, Andy .....Litchfield
Elvidge, D. G.....Granite Falls
Els, Joseph .....Seaforth
Emmans, N. H....1736 James Ave. So., Mpls.
Emerson, J. B., M. D.....
.....20 E. 30th St., New York City
Emberland, John....1989 Selby Ave., St. Paul
Englund, Oscar.....Jordan
Engman, A. E.....Hallock, R. 1
Enstad, L. O.....Granite Falls
Engel, A. W.....1460 Leland Ave., Chicago
Engebretson, Lewis .....Lake Park
Engel, Albert .....Morgan
Engson, Ed.....Clarkfield
Enny, H. W.....Blooming Prairie
Engel, Peter E.....Stewartville
Ericson, G. R.....Goodhue
Erickson, G. P.....Svea
Erlandson, Robt.....Kennedy
Erwin, D. A.....Waseca
Erickson, M. L.....Medford, Ore.
Erkel, F. C.....Rockford
Erstad, E.....Zumbrota, Box 132
Erickson, A. G.....Excelsior
Erickson, Oliver.....Atwater
Erdman, John L.....Owatonna
Erne, F. X.....887 Goff Ave., St. Paul
Erickson, S. B.....Tyler
Essig, Aug.....Sanborn
Estee, J. C.....Marshall
Etzell, Levi .....Rogers, N. D.
Evans, John L.....424 2nd Ave. E., Duluth
Evenson, Thomas N.....Mora, R. 4, Box 56
Evingson, E. M.....Kindred, N. D.
Ewing, A. L.....River Falls, Wis.

Fairfax, Mrs. J. F....2636 Humboldt S., Mpls.
Faehn, F. J.....Wallace, S. D.
Facey, M. V.....Preston
Falk, Gust A.....Glen Ullin, N. D.
Fagerlie, I. F.....Clarkfield
Fairbanks, Willis .....Mora
Farrar, F. F.....White Bear
Farmer, C. R.....Ada
Farmer, E. A.....Sta. F, R. 2, Mpls.
Farnsworth, C. H.....Albert Lea
Fannig, Miss Mary G.....
.....Birchwood, White Bear Lake
Farbes, J. S.....Hutchinson
Faust, Fred .....Valley City, N. D.
Faust, Theo.....Valley City, N. D.
Fancher, Arza R.....Fairmont
Farra, F. J.....International Falls
Farnham, Henry .....Somers, Conn.
Featherston, S. T.....Red Wing
Ferguson, Jas. A.....Duluth
Ferodowill, F. X.....Wayzata
Felland, Prof. O. G.....Northfield
Feleen, Nels N.....Spicer
Fergeson, W. C.....Litchfield
Feury, Wm. .....Hammond
Ferson, C. E.....South Haven
Ferguson, J. A.....
.....Univ. of Missouri, Columbia, Mo.
Fitzer, Chas.....Robbinsdale
Fink, Christian .....Waconia
Fisher, F. C.....New Ulm
Finke, Fred .....Excelsior
Fitzpatrick, John F..Mer. Nat. Bank, St. Paul
Fisher, Mrs. Abbie J., Merriam Park, R. F. D.
Fishbach, P. L.....Monmouth, Ore.
Fisher, Geo. A.....221 1st St. No., Mpls.
Fitzgerald, M. W.....Lake Elmo, R. 1
Figgis, Helen M.....Jordan, S. D.
Finnesgaard, C. K.....Kenyon
Finley, Vollmer .....Redwood Falls
Finke, E. H.....Ostrander
Fischer, Richard .....Wabasha
Fingerson, B.....Walnut Grove
Finstad, Joe.....Ellsworth, Wis.
Fisher, Adolf .....St. Cloud, R. 4, Box 4

Fixen, Otis.....Alexander, N. D.
Fjeldstad, Alex H.....Chrisholm
Flint, H. R.....Bena
Flagstad, J.....Sacred Heart
Flint, Henry W., Tacoma, Wash., R. 4, Box 210
Flatin, G. F.....Spring Grove
Flood, E. J.....Newman Grove, Neb.
Fletcher, S.....Matteson, N. D.
Floe, P. N.....Swift
Floreen, Swan .....Constance
Flygare, Hans H.....Atwater
Flyen, Henry .....Dawson
Flinn, Geo. M.....Medford
Flannigan, John .....Dakota
Flint, W. C.....Kimball, R. 4
Fletcher, C. A.....Cohasset
Folsom, C. W.....Wayzata
Foster, J. J.....Slayton
Ford, F. H.....Maple Plain, R. 3
Fortin, Geo. E.....Anoka, R. 5
Fossum, I. A.....Virginia
Ford, F. E.....Glencoe.
Ford, A. J.....New Rockford, N. D.
Forsaith, W. A.....Excelsior
Ford, Robt.....Balston
Folden, P.....Rollag, R. 2
Fox, C. B.....Jasper
Fossbakken, Chris.....Fosston
Formanack, F. J.....Wahpeton, N. D.
Foster, Fred .....Gooby, S. D.
Foss, Elizabeth H..824 9th Ave., S. E., Mpls.
Forest Supervisor .....Ely
Forest Supervisor.....Cass Lake
Foss, F. F.....Dassel
Folley, T. J.....Elbow Lake
Folken, K. J.....Wendell
Foslien, Lewis .....Garfield
Foss, C. L.....Rushford
Follett, A. V.....Sherburne
Fratzke, Julius .....Janesville
Fritze, Leonhard .....Claremont
Fritcher, C. E.....Hancock
Fryer, W. E.....Mantorville
Frenn, P. J.....Red Wing, R. 6
Frye, P. H.....Willmar
Freeberg, J. G.....Willmar
Freeman, Gust E.....Red Wing
French, Mrs. A. A.....Loreburn, Sask.
Friberg, Emil .....Boyd
Freeman, C. H.....Zumbrota
Frydholm, Martin.....Albert Lea
Freeman, Prof. E. M.....
.....Agri. School, St. Anthony Park
Fredrickson, Wm.....Perley
Froslan, Peter H.....Orville, Mont.
Frank, Albert D.....Wood Lake
Frost, S. E.....2613 Bryant Ave., So., Mpls.
Fredin, J. O.....Winthrop
Fruen, W. F.....816 Elwood Ave., Mpls.
Fredrickson, C. A....Elk River, R. 3, Box 65
Frankenberry, A.....Lake Itasca
Freeman, E. A.....Grand Rapids
Frels, Fred.....Bailey, N. D.
Fredin, Roy .....Columbia Heights
Fritz, G.....Wabasso
Fuller, E. D.....3417 Longfellow S., Mpls.
Fullerton, J. C.....Fairfax
Fulton, J. C.....White Bear Lake
Fullerton, Sam F.....State Capitol, St. Paul
Fuhr, Geo.....Seaforth

Galloway, J. E.....Austin
Gallap, C. A.....Long Lake
Gall, C. E.....First Nat. Bk., St. Paul
Gabrielson, Axel .....Frontier
Gantzer, Mrs. Daniel ..Merriam Park, R. F. D.
Gastfield, A. F....Victor, Mont., R. 1, Box 210
Garlick, Eva E.....Janesville
Gates, Rev. Horatio.....Willmar
Gaspard, J. P.....Caledonia
Garbisch, F. C.....Waltham
Gates, L. D.....Winnebago

Digitized by Google

Garwood, E. C.....316 Pylmouth Bldg., Mpls.
Garthe, Carl .....Hanley Falls
Garber, M. J.....Dent
Garlough, A. L.....224 W. Page St., St. Paul
Ganssle, Mrs. Geo.....2652 Hen. Ave., Mpls.
Gaylord, L. E.....981 Pacific Av., St. Paul
Gardner, C. W.....1900 Dupont S., Mpls.
Ganzer, Mrs. John.....Como Phelan, St. Paul
Garlick, Rupert E.....Janesville
Garber, E. D.....Dent
Gaumitz, G. A.....Staples, R. 1
Garrett, D. H.....Osseo, R. 1, Box 34
Gesner, Frank .....Hugo
Gerdsen, Henry .....Waconia
Gergen, N. B.....Hastings
Gearty, T. G.....Robbinsdale
Gergen, Math.....Hastings
Gerdeen, Oscar .....Wyoming
Getty, James .....Mapleton
Gerenz, Mac A.....325 Winona St., St. Paul
Gibbs, F. H.....St. Anthony Park
Gibbs, Mrs. F. H.....St. Anthony Park
Giese, Otto K.....Halloway
Gibb, John D.....Madelia
Gibbs, Miss Ida W.....318 Avon St., St. Paul
Gimmestad, M. O.....Belview
Gilpatrick, Mrs. E.....2840 Hen. Av., Mpls.
Gilbertson, A. O.....St. Ansgar, Ia.
Gippe, Miss Louise .....Watson
Gillespie, W. E.....Hopkins
Gilbertson, G. G.....Ruthton
Gile, Mrs. S. A.....3136 Irving S., Mpls.
Giles, Frank...Gadsley, Alberta, Can., Box 223
Gimblett, Jas.....229 E. Frazee St., Detroit
Gilbertson, Albert .....Halstad
Gjovig, Erick.....Canby
Glyer, Alfred.....Forest Lake
Glaspell, Bernard .....Jamestown, N. D.
Glaetzner, F. V..774 St. Anthony Av., St. Paul
Gleason, F. E.....Austin
Glessner, Mrs. Frank.....
.....3840 Sheridan Av. S., Mpls.
Goodman, D. E.....Faribault
Goodspeed, P. J.....Sta. F, R. 4, Mpls.
Goetz, G.....1709 W. 7th St., St. Paul
Goble, J. W.....South Haven
Golvin, E. R.....314 Lyceum Bldg., Duluth
Golden, M. L.....2630 Pleasant Av., Mpls.
Goordt, Thomas .....Norcross
Goodrich, Mrs. M. W.....
.....6025 London Rd., Duluth
Gould, Mrs. Edward .....
.....2644 Humbolt Av. S., Mpls.
Gould, J. F.....Clayton, Wis
Grasseli Chemical Co.....St. Paul
Grant, L. R.....Battle Lake
Graves, D. N.....Faribault
Gray, N. H.....Fergus Falls
Graling, Chas.....Spring Valley
Gray, Elmer W.....3443 Pleasant Av., Mpls.
Greaza, A. E.....St. Paul, R. 4
Gregory, H.....Jordan
Green, Wm.....Morgan
Gregersen, Jens .....Askov
Greening, C. F.....Grand Meadow
Greenwald, Henry .....Prior Lake
Greep, L. E.....Georgetown
Grenlin, Albert .....Oslo
Groat, H. G.....Anoka
Grimin, Ben .....707 E. 3rd, Duluth
Grimstad, T. K.....Brewster
Griffin, H. M.....Marietta
Gruye, Ralph .....Winthrop
Grundy, John T.....Cedar
Griffith, E. M.....Madison, Wis.
Grieve, Jas.....Buffalo, N. D.
Grubbs, W. B.....515 Kasota Bldg., Mpls.
Grunig, A. C.....
..Paraiso, Dept. Civil Admns. Canal Zone
Griggs, Burt B.....Wabasso
Gunderman, H.....Wabasha
Guiterman, A. S.....730 Lincoln Av.,St. Paul
Gustafson, A. J.....Benson
Gulette, A.....2324 Polk St. S. E., Mpls.
Gustavson, C. J.....Dunnell
Gustafson, Alfred.....Long Prairie
Gurbrad, B. M.....Porter
Gustafson, Henry ..2111 Oakland Av. S., Mpls.
Guill, R. J.....Cohasset
Gustafson, F. T.....Dawson
Gundlach, Miss Carrie .....White Bear

Habermann, John M.....Monticello
Hagen, Ole J.....Everson, Wash., R. 2
Hakel, Adolph .....Silver Lake
Haecker, Prof. F. L.Exp. St., St. Anthony Pk.
Haastad, A. P.....Fergus Falls
Hadley, Emerson .....
.....123 Farmington Av., St. Paul
Haehn, Adolph .....Madison Lake
Hackett, Jos.....Hinckley
Hack, Wm. H.....Prior Lake
Hagen, L. E.....Fountain
Hage, Paul J.....Hanska
Haack, Chas. E.....2621 18th Av. S., Mpls.
Hagberg, A. G.....Barnum
Haas, L. J.....630 Syndicate Blk., Mpls
Hagen, Wm. A.....825 E. 27th St., Mpls.
Halverson, Alfred .....Spring Grove
Hall, R. F.....New Auburn
Halverson, C. A.....Clarkfield
Hall, Thornton, W., 251 Cham. of Com., Mpls.
Haly, P. J.....Willmar
Haldorsen, Henry .....Rothsay
Halstead, Burt M.....Underwood
Hall, Harry .....Lafayette
Hall, Peter .....Bennettville
Hallstrom, C. O.....Red Wing, Box 185
Hall, L. P.....Deerwood
Halbert, C. W...208 Dispatch Bldg., St. Paul
Halverson, H. P.....Beaudette
Hamnstrom, C. J.....New Brighton
Handy, A. M.....Granada
Hansen, H. F.....Albert Lea
Hansen, Chris .....Albert Lea
Hanson, Simon J.....Dawson
Hanson, Jas. F.....Fertile
Hanson, C. L.....Fertile
Hammer, M. E.....Heiberg
Hanson, L. O.....Red Wing, R. 9, Box 24
Hanson, H. C.....Barnum
Hansen, Erick.....Petersburg, N. D., R. 1
Hanson, A. L.....Ada
Hansen, C. N.....Rush City
Hanson, H. G.....Larimore, N. D.
Hamilton, E. R.....Mpls.
Hanson, K. C.....Battle Lake
Hanchett, W. H.....Sparta, Wis.
Hanstad, Peter .....217 Union St. SE., Mpls.
Hankinson, Wm.....Winthrop
Hanson, S.....Echo
Hansen, Robt.....Robbinsdale
Hamrin, Rev. C. N.....St. Charles
Hanson, Oscar .....Ulen, R. 1
Hanson, H. J.....Gary
Hamilton, L. F.....Woodville, W. Va.
Hannola, John.....Dassel
Hanson, Mrs. Odin .....Rushford
Hanson, Gunder .....Shelby
Hart, Wm. W.....Delavan
Harley, Hugh .....Swan River, Man.
Harrison, F. M.....Glenwood
Haralson, Chas.....Excelsior
Harrison, H. W.....LeRoy
Harrison, J. R.....Eden Prairie
Hartman, F. E.....Minneiska
Harvey, C. M.....Excelsior, R. F. D.
Harrison, M. B.....Comfrey
Haseltine, E. W....4432 Dupont Blvd., Mpls.
Hartman, Frank .....Iowa
Harrison, Fred E.....
.....Agr. School, St. Anthony Park
Harold, George E.....Malden Rock, Wis.
Harper, J. L.....125 N. 4th St., Mpls.

Digitized by Google

Hartman, Joe .....White Bear
Hastings, Mrs. C. C.....Hastings
Haskell, G. W.....Grove City
Harlberg, A. M.....Heron Lake
Hassan, N.....Glencoe, Box 24
Hartwick, Ole .....Granite Falls
Harrison, H.....Doran
Harris Sisters .....Gaylord
Hartman, Henry, Jr.....Sleepy Eye
Hasty, E. A.....Blackduck
Hassard, Wm. H.....
.....158 Vermont Av., Detroit, Mich.
Harlan, C. H.....Mora
Harris, A. W.....Sleepy Eye
Hawkins, Mrs. Alice M.....
.....1523 Fremont N., Mpls.
Hathaway, C. E.....Northfield
Hawkins, J. S.....1523 Fremont N., Mpls.
Haynes, Prof. A. E....703 River Rd. E., Mpls.
Hawkins, Mrs. John.....Box 495, Mpls.
Hawkins, John.....Box 495, Mpls.
Hawkins, Mrs. J. C.....Austin
Hawkes, A. S.....Waseca
Hawkins, R. H.....Houston
Hawkes, T. B.....4203 Lombard St., Duluth
Hawkins, Alf. O.....Wayzata
Hawkinson, John A.....Red Wing, R. 6
Hatcher, Frank .....Wayzata
Hatledal, Ole O.....Benson
Hazzard, R. B.....Excelsior
Hawkes, Chas. B.....20 E. 3rd St., St. Paul
Haugen, S. O.....Zumbrota
Hawley, Mrs. N. C.....Duluth, R. 4
Haynes, S. H.....Red Wing, Box 315
Hawkins, G. C.....2918 Fremont S., Mpls.
Haugrud, T.....Pelican Rapids
Hawkes, H. B.....Excelsior
Haugen, Carl ..... 2087 Goodrich, St. Paul
Hawkins, C. E.....Houston
Hayes, J. J.....Austin
Hayden, Mr. .....Blackduck
Hawkinson, C. O.....Harris
.....4629 Lake Harriet Boul., Mpls.
Healy, G. B.....Sioux City, Iowa
Heidemann, Fred .....Japlin, Mont.
Heifort, E. A.....Stillwater
Heller, Frank .....Minnesota Lake
Heinzelman, M. M.....Arago
Hegna, Carl.....Madison
Heineman, Geo.....Danube
Heckeroft, Ed .....N. St. Paul
Heinemann, R. E.....Montevideo
Hedman, L. L.....Lamberton
Hegerle, M. H.....St. Bonifacius
Heltemez, John .....Sauk Rapids
Heitz, Paul .....Hutchinson
Heath, H. J.....Tamarack
Heck, Vincent .....Delano
Heath, Dr. A. C.....
.....330 Lowry Bldg., St. Paul
Healy, H. W.....Mapleton
Helgeson, Jacob.....Grand Meadow
Hegness, Nels.....Argyle
Hedquist, H.....Argyle
Heiden, Aug.....Wilson
Heiden, A. A. .....S. St. Paul
Hedger, Mrs. S. O.....
.....N. Main St., Aberdeen, S. D.
Hendryx, S. V. R.....Austin
Henze, Jake .....Rushford
Henderson, John.....Agri. College, N. D.
Henjum, Nels.....Frost
Henderson, H. G.....Lime Springs, Iowa
Hesselgrave, R. V.....Winnebago
Hershang, Ed.....Kenyon
Heydt, Philip .....Sargeant
Hewitt, Cameron .....Fon du Lac
Hewing, K.....Elk River
Herman, A. C.....
.....1613 Van Buren St., St. Paul
Herzog, P.....P. O. Box 29, Mpls.
Hester, M. V.....Preston
Heymann, J. A.....Caledonia
Hillborn, E. C.....Valley City, N. D.
Hicks, Wm. C.....Cedar
Hidde, Fred.....Herman
Hillger, Rev. Aug.....Rosemount, R. 3
Hill, W. W.....146 W. 48th St., Mpls
Hill, F. C.....Albert Lea
Higbie, W. S.....Eden Prairie
Hillman, C. M.....Two Harbors
Hill, C. A.....Lewiston
Hildred, Jno. W..326 W. George St., St. Paul
Highby, L. P. H.....Albert Lea
Higgin, Albert J.....Bronson
Hill, G. H.....
..513 Kimball St., Sault St. Marie, Mich.
Hiebert, F. W.....Bingham Lake
Hintermister, J. H.....
.....202 Dispatch Bldg., St. Paul
Hinkley, C. N.....Champlin
Hinds, H. W.....New Underwood, S. D.
Hines, Edward..Edward Hines Lbr. Co., Mpls.
Hjilland, J. H.....Winthrop
Hjirmstad, C. F..... Red Wing
Hlavka, F. J.....Hutchinson
Hobart, W. P.....4400 Dupont S., Mpls.
Hofmann, E. L.....Janesville
Hoehn, Adolph.....Madison Lake
Hokanson, C. J.....Center City
Hoffmann, Rev. C.....Bruno, Sask.
Hoffman, Walter E.....
.....98 Cambridge Av., St. Paul
Hokanson, John.....Bertha
Holahan, M. C.....Duluth, 206 Palladio Bldg.
Hone, Miss Daisy, M. A.....
.....1034 15th Av. S. E., Mpls.
Holmberg, J. E.....Avoca
Holmes, J. L.....1020 Plymouth Bldg., Mpls.
Holte, M. O.....Ulen
Holt, John E.....Carver
Hoover, J. L.....Kensal, N. D.
Holmgren, P. O.....Hoffman
Holten, John.....Fertile
Holmberg, J. A..1241 Edgerton St., St. Paul
Honnette, L.....Dunnell
Holliway, E.....Excelsior
Holmesland, Sam.....Ft. Shaw, Mont.
Holm, E. P.....20 W. 5th St., St. Paul
Holmes, W. F..... 732 Nic. Av., Mpls.
Hoofhower, Mrs. C.....Belle Plain
Holmes, Mrs. Joseph T. Northfield, R. 2, Box 17
Holt, John.....Wolverton
Holmes, O. W.....Grand Rapids
Hole, Al. J.....Cass Lake
Horton, W. H.....Alexandria
Horejsi, Frank.....Olivia
Hornby, H. C.....Cloquet
Howard, H. F.....Spring Valley
Howlett, Mrs. D. D.....Oskosh, Wis., R. 5
Hovland, J. O.....Fertile
Hoverstad, A. T.....Maynard
Hosmer, R. S.....Honolulu, Hawaii
Hoyne, A. J.....Albert Lea
Howland, Clinton J.....Northfield
Hornby, Chas.....Conquest, Sask.
Howland, Mrs. Eleanor.....
.....R. 1. Sta. F., care E. Landis, Mpls.
Hoss, Mrs. Nick.....Fertile
Hoyt, B. T...Hamlin and Hoyt Avs., St. Paul
Hopper, S. T.....
.....Central and 26th Avs. N. E., Mpls.
Hove, John I.....Northwood, Iowa
Hovden, C. T.....Perley
Horan, J. T.....Lake Park
Hosford, J. B.....Nashua
Houghtelin, J. M.....Chatfield
Howard, Geo. F..1281 Raymond Av., St. Paul
Hopp, Jake.....Le Roy
House, F. E.....D. & I. R. R., Duluth
Hough, Sherwood.....White Bear, R. F. D.
Hopkins, J. E....4518 Gladstone Av., Duluth
Howey, W. F.....Centuria, Wis., R. 2
Hoyt, Edward.....Scotch Grove, Iowa

Digitized by Google

Hovland, H. B.....505 Lonsdale Bldg., Duluth
Huestis, Dr. O. M....400 Central Av., Mpls.
Huff, Theo. A.....Fergus Falls
Huber, Frank.....Shakopee
Hull, F. H.....Brookpark
Hubbell, C. H.....Robbinsdale
Hubbard, F. J.....Excelsior
Huff, K. C.....Oslo
Hubbell, G. L.....
.....610 Germania Life Bldg., St. Paul
Hull, V. R.....Amery, Wis.
Hubbell, C. H.....Robbinsdale
Hughes, John S.....
.....606 Pioneer Press Bldg., St. Paul
Husser, Henry.....Minneiska
Hummel, Prof. J. A.....
.....St. Anthony Park, Broadway
Huston, H. A.....
.....Room 1804, No. 42 Broadway, N. Y.
Hurtt, Wm.....Hoople, N. D.
Husting, L. P.....Hastings
Hundt, G.....Tintah
Huss, Geo. M.....35 Franklin Hghts., Mpls
Hunt, O. W.....Lewiston
Hunt, Dr. C. W.....Indian Head, Sask.
Huse, Ole.....Cottonwood
Husmann, Wm. F.....Dakota
Husmann, Edward.....Pickwick
Hurd, Dr. W. R.....Appleton
Hurley, J. M....1510 Adams St. N. E., Mpls.
Hurst, Ed. T.....St. Hilaire

Isaacson, And.....Barrett
Isaacson, C. W.....Swea City, Iowa
Ingalls, J. A.....Spring Valley
Innes, J. C.....Luverne
Irvine, H. H....N. G. A. Bk. Bldg., St. Paul
Ingebrigtsen, Iver J.....Fertile
Isley, Fred.....Verona, N. D.
Ingersoll, T. W.....Buffalo
Inman, Arthur.....22 57th Av. E., Duluth
Irvine, Thos.
.....Nat. Ger. Am. Bk. Bldg., St. Paul
Inselman, L. T.....Litchfield
Inselman, Louis.....Litchfield
International Harvester Co. of America.
.....Mpls.
Ingersoll, F. E.....Warba
Illig, Herman.....Cogswell, N. D.
Irish, L. F.....Pine Island
Ingmundson, C. P.....
.....121 2nd Av. S., Jamestown, N. D.

Jackson, P. T.....1722 Summit Av., St. Paul
Janzen, Abr.....Mt. Lake
Jacksen, Peter.....Cloquet
Jacobson, P. G.....Madison
Jager, H. J.....Owatonna
Jaquith, O. O.....Pillager, Box 114
Jacobson, Anton.....Rothsay
James, E. E.....Little Falls
Jager, Rudolph.....Timberlake, S. D.
Jacobson, J. F.....Madison
Jager, Rev. Francis.....St. Bonifacius
Jacobson, Nels.....Wayzata
Jacobson, P. J. E.....St. James
Jackson, Mrs. A. B.....Excelsior
Jardine, J. B.....Wayzata
Jaap, W. H. E..Lester Pk. Greenhouse, Duluth
Jacobson, L. J.....Ruthton
Jackson, Jas.....Woodstock
Jacob, Willis.....Dakota
Jacobs, Dr. J. C.....Willmar
Jacobson, J. S.....Elbow Lake
Jacobson, J. N.....Hills
Jerabek, Mrs. Mary.....Excelsior
Jensen, Jens A.....Rose Creek
Jensen, Adolph.....3315 17th Av. S., Mpls.
Jensen, J. P.....Morgan
Jenson, C. M.....Albert Lea
Jedlicka, Henry.....Eagle Bend, R. 3
Jensen, Anton.....McIntosh
Jenson, Jens H.....Hudson, Wis., Box 314
Jenswold, John.....Duluth
Jensen, R.....Dickinson, N. D.
Jenson, J. J.....Alpha, R. 2
Jessen, Murray.....St. Charles
Jensen, Fred.....Twin Lakes, R. 1
Jensen, N. C.....Wyndmere, N. D.
Jensen, Chris.....Ruthton
Jenkenson, Mrs. V. I.....Excelsior
Jewell, D. B.....Deer River
Johnson, J. P.....Wayzata, R. 3
Johnson, C. J.....Pennock
Johnson, B. G.....Granite Falls
Johnson, Olaf.....Bricelyn
Johnson, John.....Danube
Johnson, John F.....Kensington
Johnson, Gust J.....Clarissa
Johnson, P. G.....3049 11th Av. S., Mpls.
Johnson, Dr. A. E.....Cloquet
Johnson, Nels E.....Appleton
Johnson, H. M.....Nevis
Johnson, David.....Kasota
Johnson, Harold J.....Greenbush
Johnson, E. A.....Maple Plain
Johnson, Fred.....Jarretts
Johnson, O. H.....Willmar
Johnson, M. R.....Winnebago, R. 3
Johnson, L. T.....Spring Grove
Johnson, Albert.....Svea
Johnson, Emil K.....Watauga, S. D.
Johnson, L. E.....Kenyon
Johnson, Jens.....Lake Crystal
Johnson, S. W.....Colgate, N. D.
Johnson, H. E.....New Richland
Johnson, C. B.....New Richland
Johnson, C. A. K.....Red Wing
Johnson, P. E.....North Branch
Johnson, Jens J.....Windom
Johnson, Albert.....Goodhue
Johnson, Arnt.....Viroqua, Wis., R. 2
Johnson, John N.....Echo
Johnson, H. S..Pioneer Press Bldg. St. Paul
Johnson, John S.....Larson, N. D., R. 1
Johnston, Mrs. J. P....3641 2nd Av. S., Mpls.
Johnson, Roy.....Ruthton
Johnson, L. F....1014 Bemidji Av., Bemidji
Johnson, M. E.....Belview
Johnson, Joel.....Caledonia, N. D.
Johnson, J. P.....Milroy
Johnson, Fred.....Sleepy Eye
Johnson, James.....Sherburn
Johnson, John A.....Marietta
Johnson, Joseph H.....Gaylord
Johnson, O. H.....Svea
Johnson, A. D.....Dassel, R. 2
Johnson, Henry V. 614 E. Lawson St., St. Paul
Johnson, P. N.....Thief River Falls
Jones, A. C.....Duluth
Jordeshangen, Lief.....Germantown
Joyce, Jas.....Grand Meadow
Jorris, Dr. F. E.....Lindley Blk., Mpls.
Jonson, C. J.....Lafayette
Jorgensen, I. B.....Hutchinson
Jones, Thos. C.....Russell
Jordin, Aug.....New London
Jones, J. Frank.....Redwood Falls
Jordan, J. J.....Shakopee
Jorgenson, Geo. M.....Clarkfield
Juell, H. L.....Killiher
Judd, J. E.....Mazeppa
Jungbauer, Frank..1000 Winslow Av., St. Paul
Jumer, John.....Pine City

Katzner, Rev. Jno. B.....Collegeville
Kahle, Martin.....Gladstone
Kalbakken, Theo.....St. Joseph, Wis.
Kadletz, J. J.....Chatfield
Kaatz, Hugo A.....Brainerd
Kapler, Geo. R.....Perham
Kasper, Hans.....Grand Marais
Kady, Wesley.....Jackson
Kangas, Henry.....Floodwood

Digitized by Google

Kast, E. C.....3124 Columbus Av., Mpls.
Keasling, F. J.....Zimmerman
Keith, John A.....Bayfield, Wis., Box 98
Keiser, Charley.....Eau Caire, Wis.
Kelley, J. V.....Cottonwood
Kelley, Clark W.....Devils Lake, N. D.
Keifer, A. J.....2434 W. 22nd St., Mpls.
Keil, A. T.....Thompson, Ia., R. 1
Kelser, John A.....Excelsior
Kelly, Mrs. M. H.....606 E. 2nd St., Duluth
Ketchum, C. S.....Brookpark
Kenning, C.....Bird Island
Keyes, E. A.....Excelsior
Kenyon, J. M.....Lamberton
Kempe, Peter.....Red Wing
Kenney, Dr. D. J..5108 Newton Av. S., Mpls.
Kent, Alby.....Dodge Center
Kenney, Elias A.....Waterville
Kendwick, W. J.....St. Cloud
Kennedy Bros. Arms Co., ...St. Paul
Kennedy, Mrs. F. R..2706 E. Superior, Duluth
Kimball, F. W.....Waltham
Kimball, Rev. J.....Duluth, R. 1
Kinkade, W. S.....Sioux Falls, S. D.
Kirkwood, R.....
.....2267 Carter Ave., St. Anthony Pk.
King, B. F.....Austin
Kirby, H. A.....Brown's Valley
Kirkpatrick, K. A.....St. Anthony Park
Kinney, S. G.....Faribault
Kiefer, Jos. C.....Rochester
Kile, H. W.....Englevale, N. D.
Kittleson, A. J.....Madison
Kirk, Loren O.....716 4th Av. S., Mpls.
Kinmore, E. W.....Chula Vista, California
Kirk, E. B.....445 Laurel Av., St. Paul
Kittson, Norman ..1017 Dayton Av., St. Paul
Kilby, Wm.....Baudette
Kinney, C. B.....International Falls
Kingsley, C. H.....5117 Thomas S., Mpls.
Kjerland, O. N.....Northwood, Ia.
Kjerstad, G. H.....Glenwood
Kleberg, John .....Willmar
Klaksvik, Iver S.....Underwood
Klemp, Rev. H. R.....Raymond
Klinkenberg, C. R.....Sta. F, R. 3, Mpls.
Klebs, J. C.....Bertha
Klevann, Paul P.....Starbuck
Klammer, Aug.....Chaska
Klessig, Lewis .....New Richland
Klinkhamer, Joe .....Heron Lake
Klein, A. L.....Caledonia
Knight, E. W..1202 N. 6th St., Estherville, Ia.
Knowles, Mrs. M. A.....Excelsior
Knudson, Kittel .....Hartland
Knutson, N. S.....Waterville
Knoff, F. B.....Madison Lake
Knoblauch, W.....Excelsior
Knowlton, J. E.....Excelsior
Knudsen, A. C.....Storden
Knaack, Oscar .....Lewisville
Knapp, C. E.....43 So. 4th St., Mpls.
Krieger, H. S.....766 Hall Av., St. Paul
Korth, Albert .....Rothsay
Kochendorfer, Karl .....South Park
Kovar, Wansel .....Owatonna
Kolisch, Aug.....St. Louis Park
Kohler, Prof. A. R.....St. Anthony Park
Kolbert, John .....Mankato, Box 508
Kosande, Jas.....Montgomery
Kotouc, Rev. A.....St. Leo
Konold, C .....Avoca
Kohnen, Nicholas .....Long Lake
Korth, Aug. .....Rothsay
Koehler, D.....Hector
Kobs, Gustav.....Westbrook
Koester, Otto J.....Heron Lake
Korstad, A.....Newfolden
Kreatz, J. F.....Wayzata
Krueger, John.....Stillwater, R. 6
Krause, Mrs. Chas....Merriam Park, R. F. D.
Krueger, Mrs. A. C.....Eden Prairie

Kropp, Chas. O.....Wadena
Krefting, Carl .....4851 Lyndale N., Mpls.
Krueger, A. W.....Groton, S. D.
Krueger, B. F.....Niagara, N. D.
Krueger, Henry.....Ormsby
Kritzeck, John .....Howard Lake
Kroll, John .....Lake Benton
Kraft, Geo.....98 W. 4th St., St. Paul
Krinkey, Herman, ...Hutchinson
Krantkremer, John.....Jordan
Kroschell, Herman, Jr.....Hinckley
Krafee, Conrad.....Dalbo
Kruger, Walter .....Paynesville
Kunkel, Jos. J.....Kimball
Kuefler, Anton .....Belgrade
Kurth, Wm. A.....Brampton, N. D.
Kuehenbecker, E. H.....Owatonna
Kullberg, E. A.....Cannon Falls
Kurth, R. R.....Brampton, N. D.
Kunz, Harry .....Annandale
Kucera, W.....New Prague
Kwetensky, John, Jr.....Chatfield
Kvendru, Halvor .....Belview

LaMont, Scott .....Park Rapids
Lamb, C., Sr.....Baker
Lamberson, L.....Warren
Laird, A. W.....Potlach, Idaho
Lafot, Edward .....Lakefield
Laechelt, Aug.....Boyd
Lambert, L. E.....Renville
Lacey, J. D....Chicago, 1215 Old Colony Bldg.
Lahn, Mrs. Geo.....Rogers
Lamm, Otto .....Elmwood, Wis.
Lagersen, Ole .....Anoka
Lambert, Mrs. Helen.....Fergus Falls
Lammers, Henry P., Jr.....Wright
Lambert, Miss A. E.....Royalton
Lagerquist, John F.....Cushing
Lack, C. A.....
.....14 W. Prosser St., Bismarck, N. D.
Larson, Gust.....Braham
Larson, C. F.....Morgan
Larson, L. U.....Lowry
Larson, Peter .....Albert Lea, Box 208
Larson, Mrs. Lewis A.....Ulen
Lane, David .....Crystal, N. D.
Larson, L.....St. James, R. 2
Larson, John P.....Alexandria, R. 4
Lane, J. W.....Anoka
Langseth, C. C.....Worthington
Larson, John ..... Lafayette, R. 1, Box 25
Lane, Dr. N. S.....Eyota
Langford, H. A.....Blackduck
Larson, Martin .....Wheatland, N. D.
Larson, W. E.....Madison, Wis.
Lane, W. S.....Cloquet
Larson, And.....Dassel
Larson Bros.....Beldenville, Wis.
Larson, J. F.....Stillwater
Larsen, Owen A.... ....St. Louis Park, R. 1
Landahl, H.....Little Falls
Larson, Charley .....Fulda
Landeene, W. E.....Elbow Lake
Larson, O. M.....Madison
Larson, Ole H.....Big Bend, S. D.
Lawrence, J. G.....Wabasha
Latourelle, J.....Hastings
Lavinge, Archie .....Walker
Lashbrook, A. J.....Univ. Farm, St. Paul
Leiner, Daniel.....Morris
Lee, Geo. F.....Hanska
Leath, Fred .....Cleveland
Leavitt, Miss Clara .....2015 James S., Mpls.
Leding, Edward .....Gary
Leibrand, Jacob .....Jordan
Leary, D. J.....Browns Valley
Leber, Wm.....1686 W. 25th St., Mpls.
Lee, E. G.....1787 Dayton Av., St. Paul
Lee, A. H.....Grand Meadow
Lee, Mrs. Ellen.....Gladstone
Lee, Ole N.....Hayfield

Digitized by Google

Lee, T. G.....Frost
Lee, Iver A.....Neilsville
Leavenworth, Prof. F. P..1628 4th SE., Mpls.
Lemay, J. T.....Mendota
Lee, W. H.....Cedar
Leidel, J. H.....Dresbach
Leonard, Geo. E.....Racine
Leach, Cora H.....Stewartville
Lee, Frank E.....Litchfield
Lewis, Chas. L..600 1st Nat. Bk. Bldg. Duluth
Leonard, Dr. L. D.....Donaldson Bldg., Mpls.
Lenz, Rudolph .....Adrian
Lennstrom, B. A.....2620 E. 22nd St., Mpls.
Lenhart, W. F.....Darwin
Lewis, Chas. L., Jr.....Shell Lake, Wis.
Levorsen, L. A.....Fergus Falls
Lepo, M. A.....Kimball
Levine, Chas. J.....St. Peter, R. 1
Lerol, John A.....Whalen
Lien, Harry A.....Montevideo
Lindquist, W. A.....Olivia
Lindsay, J. M.....Austin
Livingston, R. C.....Spring Valley
Lightner, Mrs. W. H.
.....318 Summit Av., St. Paul
Lindow, A. F.....DeGraff
Lindstrom, John A. J.....Lindstrom
Linton, Robert .....
....1045 Everett Court, St. Anthony Park
Lindgren, And.....Red Wing
Lindsey, Geo. F.....Torrey Bldg., Duluth
Lillie, R. D.....New Ulm
Livingston, J. W.....Bennettville
Lindholm, C. G.....Camden Place, Mpls.
Linn, S. L.....Foley
Lindstrand, C. A.....Winthrop
Lindmark, J. W.....Moose Lake
Lima, Dr. Ludvig.....Montevideo
Linder, E. A.....Warroad
Lindholm, V. E.....Spooner
Lieberg, C. F.....Clarkfield
Lindell, N. M.....Dawson
Liebe, W. H.....Owatonna, R. 4
Lindstrom, Mrs. Ebba.....Mora
Lowe, M. F.....Buffalo
Locke, A. W.....Dodge Center
Loegering, Aug.....Long Prairie
Lovold, E. J.....4125-31 Ave. S., Mpls.
Loop, Leeman .....Dent
Loftman, Oscar .....Fertile
Lombard, E. S.....2517 W. 52nd St., Mpls.
Loomis, C. P.....St. Peter
Logstrom, Reinhold .....Atwater
Loegering, A. J.....Long Prairie
Longfellow, Levi .....1808 Vine Place, Mpls.
Lobdell, Leroy .....Henrietta
Loye, C. C.....3537 19th Av. S., Mpls.
Lomen, O. O.....Decorah, Ia., R. 1
Lorenz, C. C.....Akeley
Love, Robt. J.....Lime Springs, Ia.
Lorentz, John .....New Trier
Louis, Chas.....Henrietta
Lokken, Ole S.....Erie
Lowe, T. P.....
..Care Am. Hoist & Derrick Co., St. Paul
Loss, Benj.....Lake City
Ludwig, Mrs. A. W....1801 Humbolt S., Mpls.
Luthi, Fred .....Hawley
Lucken, K. J.....Portland, N. D.
Luchan, H. J.....Fertile
Ludlow, H. J.....Worthington
Lundholm, Dr. E. M...677 Univ. Av., St. Paul
Ludwig, Mrs. F. B.....
.....458 Astoria Av., Merriam Park
Ludtke, H. A.....Amboy
Lundborg, Theo. A.....Nisswa
Lundgren, Paul .....Gibbon
Lund, Geo.....Excelsior
Luther, John .....Freeborn
Luce, Clint L.....Albert Lea
Lund, Mr.....Maple Plain
Luitjens, A.....Clara City
Lund, S. M.....Sturgeon Lake, R. 2, Box 37
Lynne, C. J.....Hartland
Lyon, Jay F.....Elkhorn, Wis.

Mann, C. O.....Owatonna
Magie, Dr. W. H...613 Lyceum Bldg., Duluth
Manz, F. W.....Paynesville
Magnusson, Sven .....Harris
Malmsten, F. W.....2117 Western Av., Mpls.
Malmberg, E. W.....Lafayette
Madera, F. W.....Lyle
Macoun, W. T.....Exp. Farm, Ottawa, Ont.
Manderfeld, Henry.....New Ulm
Mahler, Adolph .....Waseca
Malmquist, G.....2607 Grand Av., Mpls.
Malitor, Martin .....St. Cloud
Malberg, P. B.....Thief River Falls
Mainz, Simon .....Hastings
Mahler, C.....Fairmount, N. D.
Mann, Willard .....Buffalo
Mailand, C. H.....Newport
Malakonsky, Otto .....Lockhart
MacGillivery, N. D.....Hopkins
Magnuson, I. E.....Willmar
MacComber, G. E.....5804 Tioga St., Duluth
Madsen, M. C.....Hutchinson
Maclellan, J. A.....2607 Hen. Av., Mpls.
Malmquist, P. W.....LaMoure, N. D.
Mahan, J. W.....
.....Nat. Ger. Am. Bk. Bldg., St. Paul
Manikowski, Geo.....Mooreton, N. D.
Madder, Henry .....Dent
Maddy, Mrs. Emma.....Annandale
Marshall, Peter .....Brookston, Minn.
Marsh, F. L.....Champlin
Mareck, Titus .....420 Ridgewood Av., Mpls.
Marsh, Dr. E. V.....3040 Dupont S., Mpls.
Marken, Herman .....Morris
Marshall, H. A.....Shakopee
Marcy, C. O.....Forsyth, Mont.
Marshall, F. C.....2039 Woodland Av., Duluth
Marion, C.....Villard
Marsh, A. J.....Argyle
Martin, Henry .....Spicer
Marble, Mrs. R.....1012 E. 1st St., Duluth
Mara, Clarence .....Eastman, Wis.
Martin, Wm.....Hinckley
Martin, W. S.....Centuria, Wis., R. 2
Martenson, Nels .....Hutchinson
Maschger, A. F.....859 E. 7th St., St. Paul
Mathews, Mrs. Jas. H.....Larimore, N. D.
Masterson, C. H.....Pennock
Mathison, Geo. W.....Windom
Massee, A. W.....Albert Lea
Mather, J. S.....Madelia
Mayo, E. D.....2808 S. Fremont, Mpls.
Maust, S. H.....Canton
Mather, J. H.....Faribault
Mayman, E. W.....Sauk Rapids
Matzke, Sil.....So. St. Paul
Mayland, A. W.....Albert Lea
Mathiason, Jacob .....Walnut Grove
Mathison, Thoger.....St. Paul Park
Mason, G. A.....Maple Plain
May, Mrs. Burt .....Albert Lea
Mayne, Prof. D. D.....Univ. Farm, St. Paul
Maxwell, Alf.....Excelsior
Mattison, Dr. C. W....Swea City, Ia., Box 201
Mattison, Mrs. A. M.....Hammond
Matson, P. G.....Pelican Rapids
Meininger, L.....Sherburn
Menzel, H.....Odessa
Merritt, C. W.....Winona
Merriam, L. O.....2020 Fremont N., Mpls.
Meisell, Wm.....1945 Stewart Av., St. Paul
Merrill, E. E.....Mendota
Merrill, Mrs. F. A.....Mendota
Merritt, W. H.....Moorhead
Mellinger, T. S.....Pine Island
Merrill, Geo. E..4604 Washburn Av. S., Mpls.
Meader, H. H.....Dent
Mense, F. G.....3941 Aldrich S., Mpls.

Digitized by Google

Meyer, Henry .....Blue Earth
Meyer, J. H.....Austin
Methus, N. N.....Hanlontown, Ia.
Meyer, C. H.....774 West Av., Red Wing
Meyer, Wm. H.....Waseca
Meyer, F. C.....Dent
Meyer, F. C. A.....Fairmount
Miks, Rev. A.....St. Michael
Mpls. Public Library .....Mpls.
Miller, E. B.....Mpls., R. 1, Sta. F
Milne, H. A.....Meckinock, N. D.
Mighton, S. R.....Winnipeg, Man., Box 1393
Miller, A. M.....Harmony
Miller, H. J.....Cologne
Miner, J. E.....3022 Dupont S., Mpls.
Mix, H. P.....Lidgerwood, N. D.
Miller, Warren, ...Lake Benton
Miller, Uri .....Brookpark
Mitchell, D. M.....Owatonna
Miller, M. J.....Jackson
Miller, O. H.....Marshall
Minder, Emma .....Ortonvillle
Mickelson, Nels .....Austin
Miller, E. L.....Verona, N. D.
Mich, John .....Rochester
Mitchell, Arch .....Coaldale, Alta.
Miller, John .....Kellogg
Mittelstadt, Wm.....Waseca
Miller, J. A.....Jasper
Miller, John W.....Jackson
Mitchell, J. L.....Austin
Miller, Robt....West Side Sta., R. 2, St. Paul
Michael, Geo.....Walker
Mihleis, Dr. E. W. G.....Ellsworth, Wis.
Miner, W. C.....Dent
Miner, R. R.....Dent
Mohl, Fred ....511 Capitol Bk. Bldg., St. Paul
Moeser, Miss Flora .....St. Louis Park
Moehring, Otto .....Montevideo
Moe, Gregor .....Gary
Moot, Mrs. A. T.....3723 W. 44th St., Mpls.
Moe, T. Randall .....Montevideo
Moore, W. M.....
.....Forest Service, Santa Barbara, Cal.
Moeser, Ed .....St. Louis Park
Modlin, E. L.....Excelsior
Moore, Mrs. C. F.....Worthington
Moore, C. P.....Merrifield
Moberg, Aron .....Lowry
Molin, C. A.....Excelsior
Molin, E. J.....Excelsior
Moen, L. O.....Fosston
Moore, H. U.....Care First Nat. Bk., Duluth
Moak, Mrs. M. A....2621 Bryant Av. S., Mpls.
Moldenhauer, Albert.....La Crescent
Moir, Miss Marion W.....R. 1, Mpls.
Monson, N. L.....Buffalo Lake
Moran, Rev. J. P.....2424 18th Av. S., Mpls.
Moris, Mrs. Frank .....Lake Elmo
Morrison, Wm. .....Aldrich
Morrison, Rev. J. D.....
.....2131 E. Superior St., Duluth
Morton, G. F.....Lake Itasca
Morsing, Christ.....256 Winona St., St. Paul
Morshing, Carl W.....Waterville
Moran, C. B.....Newport
Morey, Geo. W.....Journal Office, Mpls.
Morrison, Alex.....Bathgate, N. D
Morovec, Jos.....Biscay
Morple, E. E.....Wendell
Morris, A. L.....Tenstrike
Moran, Mrs. N. B.....3rd Av. N., Crookston
Moreau, T. V.....2627 Irving S., Mpls.
Moses, Mrs. W. S.....Wahkon
Motter, J. P.....Lamberton
Mousel, Henry .....Canby
Moss, W. F.....Worthington
Moum, Ingebright .....Buffalo, N. D.
Munch, Mrs. E. W.....Crookston
Mullen, A. J.....Custom House, Mpls.
Musser, C. P.....Muscatine, Ia.
Munson, M. N.....Montevideo, R. 5

Mueller, Frank .....Hayfield
Mueller, Paul L.....4845 Bryant S., Mpls.
Mundefor, Barne .....St. Cloud, R. 3, Box 90
Mueller, Anton S. .....Madison
Mudd, Mrs. Neva .....Sandstone
Murray, J. W.....Excelsior
Murray, D. L.....Blooming Prairie
Myrah, E. G.....Spring Grove
McBroom, J. K.....Excelsior
McCullough, Francis .....Maple Plain
McConnell, J. O.....St. Cloud
McCabe, Mrs. M.....Richfield Sta., Mpls.
McCurdy, J. B. K.....Madelia
McConachie, N.....Perham
McCarthy, Miss Esther .....Madelia
McCall, Thomas M.....Crookston
McCallum, John .....Clinton
McCorquodale, James .....Olivia
McCuskey, H. B.....Holyoke
McClay, Elmer .....Hewitt
McCoy, Dr. Mary ..15 W. Superior St., Duluth
McCuskey, Dr. Charlotte .....Holyoke
McDonald, W. M.....Excelsior
McFadden, Wm.....Fergus Falls
McDonald, Prof. G. B.....Ames, Ia.
McGolrick, Rev. Jas.....Duluth
McGowan, J. F.....Fergus Falls
McGuire, A. J.....Grand Rapids
McGuire, S. H.....Annandale
McIntosh, S. M.....Renville
McIntosh, Mrs. .....
.....New England Furn. Co., Mpls.
McGonagle, Mrs. W. A..Hunters Park, Duluth
McGrew, E. M.....Clarkfield
McGonagle, W. A....D. M. & N. Ry., Duluth
McKinney, C. R.....4507 Blaisdell, Mpls.
McKay, J. L....56th St. & Pleasant Av., Mpls.
McKenna, Hugh J.....St. John, N. D.
McKinstry, L. C.....Detroit
McLain, J. A.....Amboy
McLellan, David .....Bowesmont, N. D.
McMullen, A.....Mound
McMillan, F. G.....No. 2, 5th St. SE., Mpls.
McLarty, W. R.....Outlook, Sask.
McLeod, Neil A.....508 1st Av., NE., Mpls.
McManus, E.....McIntosh
McNee, Jas. C.....Spring Valley
McNelly, C. L.....Willmar
McNair, C. I.....Cloquet
McNeil, Mrs. Alex.....Dayton
McNally, J. A.....Ogilivie

Nash, T. W.....3113 Holmes Av., Mpls.
Nagel, T. W.....1118 W. Lake St., Mpls.
Nameland, N.....Porter
Narratil, W. F.....Silver Lake
Neison, Geo. S.....Foxleigh, Sask.
Neils, Julius .....Cass Lake
Neal, Mrs. J. A. P..1616½ E. 6th St., Duluth
Nelson, Geo. A.....Milltown, Wis.
Nelson, J. G.....Badger
Nelson, O. B.....942 17th Av., SE., Mpls.
Nelson, C. N.....Storden
Nelson, J. P.....Fairmount, N. D.
Nelson, Oscar W.....Deerwood
Nelson, Chas. F.....Braham
Nelson, C. G.....Lindstrom
Nelson, Peter .....Red Wing
Nelson, F. A.....Atwater
Nelson, Edward O.....Lanesboro
Nelson, Hans .....Fergus Falls
Nelson, Jacob .....Beltrami
Nelson, Hans.....Twin Valley
Nelson, C. A. A.....Alexandria
Nelson, Peter E.....Montevideo
Nelson, O. M.....Elk River
Nelson, Iver .....Cottonwood
Nelson, O. R.....Madison
Nelson, Anton .....Grasston
Nelson, Chas. J.....Kandiyohi
Nelson, Will .....Underwood, R. 2
Nelson, John W.....5 E. Superior St., Duluth

Digitized by Google

Nelson, J. N.....Aitkin
Nelson, F. A.....Maple Plain
Neller, E. J.....Hayfield
Nelson, Nels C.....Canby
Nelson, H. C....P. O. Box 361, Grand Rapids
Nelson, Carl .....Marble
Nelson, Elmer .....Austin
Nelson, Ludvig .....Cambridge, R. 1
Nelson, Mrs. Sim.....Westbrook
Nelson, Helge .....Raymond
Nelson, Swan .....Willmar, R. 8
Nelson A.....Kimball
Nelson, N. E.....Milaca, Box 76
Nelson, H. C.....Princeton, R. 1, Box 87
Nelson, Sam .....Argyle
Nelson, A. G.....4812 Upton S., Mpls.
Ness, H. H.....Tappen, N. D.
Nesseth, T. H.....Fertile
Newman, Dr. G. A.....
.....410 W. Olive St., Stillwater
Nesom, Prof. G. H.....Kenyon
Ness, J. M.....Wahpeton, N. D.
Newland, H.....108 1st Av. N., Mpls.
Nieman, Chas.....Hamburg, Wis.
Nielsen, Hans .....159 Duke St., St. Paul
Nichols, W. G.....Waltham
Niemeyer, H. H.....Homer
Niemeyer, C.....Box 379, Duluth
Nielsen, H. P.....Cass Lake, Box 77
Nicols, M.....St. Paul
Nielson, Henry.....Hinckley
Nielson, A. E.....Walker
Nixon, J. H.....Nevis
Nichols, S. S.....707 Cham. of Com., Mpls.
Noble, A. S.....Dent
Nott, F. G.....Howard Lake
Norderhus, Paul P.....Murdock
Nordby, Ed J.....Renville
Nolte, Henry .....Duluth
Nourse, Harvey .....Bayfield, Wis.
Noltimier, H. A.....Excelsior
Norval, Wm.....Elk River
Norwood, H.....Balaton
Norrgard, Ed....Hopkins, R. 3, care Granlund
Noerenberg, Fred .....Cascade Springs, S. D.
Nordberg, Theo. M.....Victoria
Nordquist, O....33 W. Sycamore St., St. Paul
Noble, T. E..... .....Albert Lea
Norman, Nels .....Pelican Rapids
Nutter, F. H.....710 Sykes Blk., Mpls.
Numbers, M. W.....898-21 Av. SE., Mpls.
Nydahl, J. L.....715 21st Av. S., Mpls.
Nystrom, Guat .....Worthington
Nye, Geo. M.....
.....Care American Sprayer Co., Mpls.
Nygaard, M. M.....Park Rapids

O'Brien, Pat .....Renville
Oakey, J. P.....Red Wing
Obeslo, Jos J....19 & Clark St., Sioux City, Ia.
O'Brien, Rev. T.....Hutchinson
Oberg, John.....Taylors Falls
Odell, Mrs. R. R.....2836 Irving S., Mpls.
Ohnstod, Lewis .....Cannon Falls
Ogaard, R. A.....Kenmare, N. D.
Olson, Lewis.....Kalispel, Mont., R. 3
Oldenburg, Henry C.....Carlton
Older, F. E.....Oconomowoc, Wis.
Olsen, H. P.....St. Louis Park, R. 1
Olson. Aug. P.....Kennedy
Olson, J. B.....Willmar
Oleson, Michael .....Montevideo
Olson, E. S.....Milan
Olson, Mrs. D. W.....White Bear
Olson, John G.....Alexandria, R. 8
Olson, Peter M.....Zumbrota, R. 6
Olson, John E.....Little Falls, R. 6
Olmstead, Rett E.....Excelsior
Olson, O. E.....Dalbo, R. 1
Olney, Will .....Knox, N. D.
Olson, Daril W.....White Bear Lake, Box 413
Olson, Ova .....Boyd
Olson, O. J.....20 W. 5th St., St. Paul
Olson, C. F.....Rochester, 215 Line St.
Olson, Magnus .....Willmar
Olson, K. D.....Harmony
Ollson, Willbur .....Valley River, Man.
Olson, Edward.....Dent, R. 2
Oliver, Mrs. C. J....Waldheim,. Sta. F, Mpls.
Oredalen, Ole .....Kenyon
O'Neill, O. H.....608 Globe Bldg., St. Paul
Ongstad, H. H.....Pelican Rapids
Opsata, C.....Bemidji
O'Neill, J. H.....Park Rapids
Orcutt, Mrs. Josie .....Foley
Omland, Erik.....McIntosh
Orburg, Peter .....Dunnell
Orr, G. R.....Quincy, Cal.
Osborn, John .....Dassel
Ostern, L. N.....Montevideo
Oslund, N. N.....Cambridge
Otte, Burton ....Belview
Ostrolenk, Bernhard .....Slayton
Osmanson, Ed.....Dawson
Osborn, L. M.....Virginia
Osborne, E. W.....328 B. P. Bldg., St. Paul
Oyen, O. J.....Watson
Overdick, Wm.....Hopkins
Overlee, Swan....902 2nd St. N., Fargo, N. D.
Oversholt, Fred.....4318 Pillsbury Av., Mpls.
Owens, Thomas...D. & I. R. R., Two Harbors
Overgaard, P. H.....Albert Lea

Pabody, E. F.....69 S. 11, Mpls.
Palmer, C. A.....1477 Ashland Av., St. Paul
Page, Leslie .....Stewartville
Palmer, A. T.....Mpls., R. 8
Palm, Ernest E....577 Genesee St., Rochester
Palmer, R. W.....Long Lake
Palmer, Henry .....Excelsior
Panek, John .....Lucan
Palzer, Casper .....Mazeppa
Pace, W. G.....Austin
Palmer, F. D.....Ocheyedan, Ia.
Palm, O. A.....Kimball, Box 42
Parks, W. S.....Thorp, Wis.
Parnam, E. A.....Hudson, Wis.
Partridge, H. C.....Owatonna
Parker, Wm. A.....55 E. 6th St., St. Paul
Parker, C. W.....Valley River, Man.
Payne, Capt. S. D.....Kasota
Paulson, G. C.....Elbow Lake
Patton, U. T.....Osseo
Patten, J. W.....Long Lake
Patterson, Mrs. G.....Morristown
Pauzram, H. A.....Waseca
Patten, E. C.....Charles City, Ia.
Paul, B. H.....Lockhart
Pauly, Nic.....Chanhassen
Patten, H. G.....Charles City, Ia.
Paulson, Fred....Augsburg Seminary, Mpls.
Paulsen, Mrs. Ida.....Cresco, Ia.
Patterson, Chas. .....Frazee
Person, Lewis .....Robbinsdale
Pedersen, H. C.....Hopkins
Peiffer, N. J. Al.....Eden Valley
Penney, John .....Cushing, Wis.
Pendergast, R. H....4327 Luverne St., Duluth
Penning, Martin .....New Ulm
Pederson, P. A.....Beardsley
Pengilly, Jas. .....Osseo, R. 1
Perry, P. H.....Excelsior
Perkins, Mrs. Mary A.....
.....2426 Crystal Lake Av., Mpls.
Perret, Frits E.....Zumbrota
Perkins, A. G....1780 Wakefield Av., St. Paul
Perkins, Thos.....Race Track, Mont., Box 9
Pederson, R. C.....Minot, N. D.
Pederson, Mrs. Simon.....Leith, N. D.
Persons, C. O.....Dundas
Peck, C. M.....Excelsior
Peck, Chas. S.....4410 Upton S., Mpls.
Pedersen, A. W.....Comfrey
Peeler, D. E.....Park Rapids

Digitized by Google

Peck, Clyde .....Marble
Peoples, Hugh .....New Rockford, N. D.
Pennington, E.....M. St. P. & St. M., Mpls.
Pederson, M. P.....Walnut Grove, R. 2
Peroutky, J. W.....Merrill, Wis.
Pellet, F. A.....Akeley
Peake, W. M.....Chisago City
Peterson, Alvin .....Astoria, S. D.
Peterson, Chas. V.....Stanchfield
Peterson, Jos. .....Lake Crystal
Peterson, P. H.....Atwater
Peterson, C. O.....Willmar
Peterson, Carl F.....Storden
Peterson, F. C.....Atwater
Peterson, F. J.....Waconia
Peterson, O. M.....Albert Lea
Peterson, T. B.....Blooming Prairie
Peterson, R. Waldo.....Canby
Peterson, P.....2629 Lyndale N., Mpls.
Peterson, A. H.....Brandt, S. D.
Petit, P. J.....3438 Pleasant, Mpls.
Peterson, Carl.....Astoria, S. D.
Peterson, S. G.....Redwood Falls
Pew, Fremont C.....Mankato, R. 5
Petterson, M. .....Willmar, 1117 5th St.
Peterson, Fred.....Albert Lea
Peterson, L. E.....Stanchfield, R. 1
Peterson, John .....Proctor, R. 1
Peter, Justus .....
..Cor. Smith Av. & Annapolis St., St. Paul
Peterson, A. .....
2317 W. 7th St., care W. Swanson, St. Paul
Peterson, Jas. L.....Blooming Prairie, R. 1
Peterson, C. .....Echo
Peterson, J. P.....Cloquet, R. 1
Peterson, Hans .....Columbia Heights, Mpls.
Peterson, P. C.....Albert Lea
Peterson, C. O.....Lake Elmo
Peterson, Alfred .....Jackson
Peterson, Gus .....International Falls
Peterson, A. J.....Dawson
Peters, H. D.....Windom
Peterson, G. C.....Kimball, R. 3
Peterson, P. C.....Willmar
Peterson, Gunerius .....Fairfax
Pfister, J. M.....Marietta
Pfaender, Wm., Jr.....New Ulm
Pfeiffer, C. A.....Winona, R. 1
Pfeiffer, Fred .....Morton
Pfeiffer, Henry .....Mahnomen
Pfeil, F. C.....St. Charles
Phelps, Frank.....Mapleton
Phillips, E. M.....1946 Laurel Av., St. Paul
Philbin, D. M.....408 Sellwood Bldg., Duluth
Pierce, J. Dexter.....Larimore, N. D.
Pineo, Dr. W. B....507 Pillsbury Bldg., Mpls.
Pierce, C. A.....New Richland
Pine Tree Mfg. Co.....Little Falls
Pilcher, L. C.....1024 Miss. St., St. Paul
Pickard, Prof. A. E.....Hinckley
Pierre, Gotlieb.....Jordan
Pickle, B. O.....Madison
Pierson, J. P.....Tracy, Box 25
Pickering, R. C.....Univ. Farm, St. Paul
Plants, D. V.....Long Lake
Plath, Ernest .....Delano
Pond, E. R.....Mpls., R. 1
Porter, J. F.....3411 Garfield, Mpls.
Popple, John.....Frazee
Pollard, A. A.....2012 Columbus, Mpls.
Pollock, C. S.....Standard Oil Co., Mpls.
Polk, Grace E.....2435 Harriet, Mpls.
Poe, R. M.....Glencoe
Polowski, Mrs. Albert.....Dent
Potter, A. H.....230 Sec. Bk. Bldg., Mpls.
Poussin, G. W.....Onigum
Powers, Frank W....2816 Garfield Av., Mpls.
Powell, F. W.....Willmar
Powell, Wm. H.....Osage
Posz, L. A.....Winona
Prentice, Chas. D....Highwood, R. 4, St. Paul
Prosser, L. W.....Leroy
Probstfield, A. P.....Moorhead
Priedal, Joe .....Taunton
Prosser, F. D.....Wykoft
Price, Overton W.....
Nat. Conservation Assn., Washington, D. C.
Prentice, S. L.....Winona
Prestrud, M. A.....Eastedge, N. D.
Putman, E. T.....Excelsior
Putnam, A. D.....St. Charles
Putnam, S. T.....Battle Lake
Public Library.....St. Paul
Putnam, Hon. A. F.....Minneiska
Pyle, J. G.....726 Globe Bldg., St. Paul

Quale, G. E.....Willmar
Quam, O. T.....Nerstrand
Quady, P. E.....Sta. F, R. 2, Mpls.
Quammen, Theo.....Clarkfield
Quinn, Mrs. J. J.....
.....4042 Wentworth Av. S., Mpls.
Quimby, J. B.....Staples

Radabaugh, N. C.....2420 32nd Av. S., Mpls.
Randall, Frank L.....St. Cloud
Rains, Dr. J. M.....Willmar
Rankin, Prof. A. W..916 5th St. S. E., Mpls.
Ramsdell, Chas. H..911 Pheonix Bldg., Mpls.
Rainy, Wm.....Rainy
Radcliffe, Robt.....Larimore, N. D.
Rattenstetter, John.....Eden Valley
Rafelson, Anton .....Montevideo
Randall, R. R.....Warsaw, Wis.
Rasmusson, A.....Ruthton
Ramey, E. W.....Redwood Falls
Ray, F. W.....Columbia Heights
Raunesville, Ed .....Traverse
Ransom, Henry .....Annandale
Rarick, J. O.....Climax
Rebers, H.....Wood Lake
Reed, S. J.....Webster, S. D.
Reeder, G. S.....Sauk Rapids
Reel, E. G. E.....Excelsior
Reeves, C. E.....225 Clifton Av., Mpls.
Reed, Byron W.....Brookpark
Reeverts, Geo. J.....Monroe, S. D.
Records, Percy C....State Capitol, St. Paul
Reese, T. N. J.....McIntosh
Reed, John A.....707 Cham. of Com., Mpls.
Reynolds, G. T.....Frontinac
Rehbein, Ed.....Duluth, R. 3
Renneke, E. A.....Arlington
Reil, John H.....Brownton
Remel, Casper.....Menomone, Wis., R. 10
Reinking, Wm.....Osseo
Rekedal, S. E.....Vesta
Reid, J. D.....Hopkins, R. 3
Reichert, John.....Red Wing
Reichow, H. A.....Newport
Remund, Roy C.....Waseca, R. 2
Reimpage, Henry.....Perham
Richardson, Ira E.....New Brighton
Richardson, E. A.....Sparta, Wis
Richardson, Mrs. Ira E.....New Brighton
Richardson, L. P.....Comfrey
Rice, Aug. C.....Spring Grove
Riehl, Frank.....Belle Plain
Richardson, A. W.....Howard Lake
Rice, John A.....Renville
Rieke, Adolph .....Fairfax
Rice, F. O.....Northfield
Richards, J. M.....Bemidji
Richardson, H. P.....Rochester
Richardson, N. D.....
.....care Swift & Co., Chicago, Ill.
Rietmann, F. G.....Red Wing, R. 5
Richal, W. A.....Excelsior
Rice, L. H.....Park Rapid
Riegert, Wm. D.....St. Hilaire, R. 2
Rislov, J. I.....Northwood, Iowa
Rixon, Chas.....St. Louis Park
Rindahl, O. O.....Brooten
Ritter, C. H.....Plainview

Digitized by Google

Ritchie, Leroy.....Annandale
Risser, J. C.....Elbow Lake
Robinson, Reuben.....Champlin
Robertson, Mrs. Eva.....
....1139 Raymond, Av., St. Anthony Park
Robertson, Lynn S.....
....1139 Raymond Av., St. Anthony Park
Robinson, Geo. W.....
.....1409 W. Minnehaha St., St. Paul
Robinson, S. Roe.....Maple Plain
Roberts, Henry.....Fergus Falls
Robinson, Jos.....Centuria, Wis., R. 2
Robinson, B. E.....Dent
Rockman, N. M.....Barron, Wis.
Rogers, C. R.....Mound
Rockwood, Eli .....Madelia
Rodgers, Dr. Emma.....Newport
Rockney, Ole T.....Sharon, N. D.
Rodecker, L. V.....Gladstone
Rohan, Mrs. M. A.....1004 Nic. Av., Mpls.
Rockwell, Martin E.....Ismay, Mont.
Roehrich, J. P.....1118 W. Lake St., Mpls.
Rodewald, W. D.....Plum City, Wis.
Rockhill, Harlow.....Conrad, Iowa
Rowell, H. H. S.....Lewiston, Idaho, Box 228
Roragen, E. P.....Fertile
Rose, Fred .....Gaylord
Rosendahl, Peter J.....Spring Grove
Romberg, Frank F.....Sleepy Eye
Ross, Norman M.....Indian Head, Sask.
Rosenwald, J. F.....Madison
Rosander, J. W.....Wayzata
Rosendahl, Ben.....Jordan
Ross, Malcolm N.....Regina, Sask.
Rosacker, Hans..19 Av. & 8th St. NE., Mpls.
Rose, L. D.....Two Harbors
Rosenquist, O. H.....Oakes, N. D.
Rostomily, Richard .....Heron Lake
Rosing, A. H.....Mora
Rosen, E. R.....Skyberg
Roteman, A. L.....Badger
Runals, Maj. D. E.....Edgerton
Rucktaeshel, Geo. .....Seaforth
Rupley, Geo. .....Duluth
Ruedlinger, C. N..2924 Aldrich Av. S., Mpls.
Russell, Dr. E. B.....Excelsior
Rushlow, Geo. .....Lakeside
Russell, S. B.....Rochester
Ruggles, Prof. A. G.....St. Anthony Park
Rudolph, M. D.....Vergas
Rueter, H. .....Echo
Rue, H. K.....Jackson
Rutter, H. H.....Winona
Rustad, Edward .....Wheaton
Rudolph, Henry .....Detroit
Rydeen, Arthur .....Marietta
Ryan, Timothy .....Hopkins
Ryberg, And. .....Balaton
Rysestad, Knut O.....Fosston
Ryberg, Emil .....Balaton
Ryan, T. J.....4516 Abbott S., Mpls.

Salzer, Geo.....2400 Wash. N., Mpls.
Sahler, Emil .....Waseca
Salbach, F. C.....
.....116 7th St. N., Great Falls, Mont.
Sallstram, A.....Winthrop
Sachs, Robt. F.....Jordan
Sand, Ole O.....Elbow Lake
Sawyer, Mrs. N. S.....Excelsior
Sandrock, Wm. .....Rushford
Sarff, M. L.....French River
Sayre, R.....7205 Jeffrey Av., Chicago, Ill.
Sargent, C. A.....Red Wing
Sandvig, H. J.....Brooten
Saufferer, Geo. .....Morristown
Sartell, Mrs. Jos.....St. Cloud
Saunders, Claude F.....Pense, Sask.
Sandvig, C. R.....Belgrade
Sandman, F. A.....Webster
Sandberg, Karl .....Red Wing
Sawyer, Mrs. J. L.....Perham
Sandboe, I. A.....Wegdahl
Sawyer, G. H.....Jackson
Sane, Peter P.....Montevideo, R. 1
Savage, Thos..Janesville, "The Cedars," R. 1
Sarver, Grant .....Excelsior
Sandeen, E. W.....St. Peter, R. 1
Saunders, J. P.....Brainerd
Sauer, W. F.....N. St. Paul, R. 1
Santag, B. B.....Heron Lake
Satter, Lewis .....Morris
Sandberg, C. M.....Lake City
Savard, O.....Bald Eagle Lake
Scott, Wm. G.....
.....99 Couchon St., Winnipeg, Man.
Schlemmer, A.....Chisago City
Schotzko, F. E.....Springfield
Scullin, Arthur .....628 S. Smith, St. Paul
Schwerin, Henry .....Echo
Scheyer, Otto .....Calloway
Scherber, J. D.....Rogers
Schreiner, Francis X.....
.....1176 S. Robert St., St. Paul
Schmidt, Edward .....Mankato, R. 3
Schmitt, Geo. F.....Jordan
Schaaf, Val. G.....Murdock
Schiffrer, Rev. Val. .....Madison
Schermer, C. .....Maple Lake
Schwyzer, Dr. G.....411 Don. Bldg., Mpls.
Schmitz, Jacob .....Shakopee
Schrooten, J.....Fairmount
Schroeder, Wm. .....Seaforth
Schroeder, Emil .....St. James
Schaefer, Alois .....Jordan
Schwahn, E. M.....Wabasso
Schmidt, Wilk.....545 Sibley St., St. Paul
Schnieder, Phil .....Madison
Schenck, C. A.....Biltmore, N. C.
Schram, E. .....Frazee
Schmidt, Godfrey .....Clearfield, S. D.
Scoville, S.....Turtle Lake, Wis.
Schneider, Frank .....Chaska
Schindler, W. J....34 Virginia Flats, St. Paul
Schumann, Carl .....Lake Park, Ia., R. 3
Schirmers Rev. P.....Cologne
Schimbeno, A. .....Anoka
Scott, Z. D.....Scott-Graff Lbr. Co., Duluth
Schulez, Peter .....Wells
Schroeder, E. C.....Moorhead
Schroeder, Louis .....Erie, N. D.
Schipper, Geo. .....Renville
Schwarz, Otto .....Lewisville
Schroedel, Mat. .....Sherburn
Schneider, Geo.....St. Peter, R. 2
Schumacher, Mrs. A. J.....St. Cloud
Schultz, John F.....Aldrich
Schlemmer, C. H....1602 Hague Av., St. Paul
Schnathorst, Wm. .....Frazee
Schaefer, A. .....Elbow Lake
Schieder, Hubert .....Hastings
School District No. 149.....Granger
Schleim, Wm. .....Sioux Falls, S. D., R. 5
Schultz, Fred C.....Montevideo
Schwanke, H. J.....Glencoe
Schlauberg, C. .....Vergas
Schniderhahn, J. C.....St. Clair
Schmith, W. W.....Long Prairie
Scanlon, John S.....Long Prairie
Schields, P. H.....Perham
Sell, Chas. .....Delano
Selvig, C. C.....Willmar
Seiler, J. M.....Excelsior
Secor, Eugene .....Forest City, Ia.
Searles, Mrs. J. N.....Stillwater
Searle, Robert .....Hammond, Wis.
Seifert, Frank L.....New Ulm
Seide, H. C.....Nicollet
Seguin, Frank .....Bertha
Selvig, C. G.....Crookston
Severson, F. L.. .....Stewartville
Sengstack, J. L.....2109 W. 68th St., Chicago
Sevald, P. S.....Erksine, R. 3
Seymour, R. F.....Swatara
Shannon, R. .....Annandale
Shepley, Mrs. E. L..12 Summit Court, St. Paul

Digitized by Google

Shave, Alf. S.....Hawley
Shattuck, B. N.....Whalan
Shattuck, G. W.....Whalan
Shaw, Robt. .....Funkley
Shelley, T. E.....Austin
Shaw, O. W.....Austin
Sherwood, C. H.....Willmar
Shelmire, Anna H.....807 3rd Av. S., Mpls.
Shelton, F. G.....Mayville, N. D.
Shenahan, F. C.....Univ. of Minn., Mpls.
Sherwood, Geo. E.....Kimball
Sherwood, Geo. .....Dent
Sheafe, Mrs. M. W.....
.....207 4th Av. NW., Watertown, S. D.
Shirley, H. L.....Breckinridge
Shogren, Axel G.....Madison
Shrien, J. H.....Tyler
Shuman, H. W.....Excelsior
Shuman, Mrs. H. W.....Excelsior
Simmons, Harold .....Howard Lake
Simpson, Hon. David ..Mpls., N. Y. Life Bldg.
Siewert, C. E.....Hopkins
Simons, W. D.....2401 Grand Av., Mpls.
Simons, H. L.....Glencoe
Siverts, John .....Marshall, N. D.
Sibbert, Mrs. J. H.....Annandale
Sipher, Mrs. A. J.....Aitkin
Siemons, W. L.....Belle Plain
Siemer, F. H.....Moose Lake
Simmons, W. A.....
....1620 S. Spring Av., Sioux Falls, S. D.
Sigler, Homer .....Appleton
Simpson, S. R.....Excelsior
Sievers, Fred P. 28 Althauser Av., Dubuque, Ia.
Silness, E. T.....Bisbee, N. D.
Sjastron, Victor .....New Ulm
Skytte, C. J....Fisher & Autumn Sts., St. Paul
Skotterud, E. O.....Dawson
Skinner, J. W.....Royalton
Skinnemoen, Ole .....Wendell
Skoog, A. L.....Carver
Skinner, J. H.....Austin
Skjerwem, E. H.....Hayfield
Skinnemoen, Henry .....Wendell
Skoda, Anton .....McKinley
Sloan, F. G.....Ellendale
Slayton, J. .....Boyd
Slocum, N. .....Camden Sta., Mpls.
Smith, C. H.....Faribault
Smith, L. W.....St. Paul, R. 2
Smith, F. C.....Plumb City, Wis.
Smith, Mrs. W. S..541 Portland Av., St. Paul
Smith, Mrs. J. H....249 Ramsey St., St. Paul
Smith, W. H.....Madison, Box 150
Smith, Lyman S.....Wayzata, R. 1, Box 103
Smith, C. A.....Mpls.
Smith, Aug. .....Austin
Smith, Theo. E.....3553 4th Av. S., Mpls.
Smith, A. R.....Excelsior, care P. Harrison
Smith, Alonzo .....Excelsior
Smith, S. D. .....Stanton
Smith, C. L.....2018 Hawthorn Av., Mpls.
Smith, T. C.....Lakeville
Smith, C. W.....Maple Plain
Smith, Mrs. G. M..2131 Woodland Av., Duluth
Smead, B.....157 E. Congress St., St. Paul
Smith, A. D.....Redwood Falls
Smith, M. G.....Sherburn
Smith, F. F.....218 W. 4th St., Joplin, Mo.
Smith, L. Z.....Mankato
Smith, Judson .....Tintah
Smith, J. D.....Doran
Smith, R. D.....Island
Smail, W. T.....Glen Lake, Hopkins
Snyder, C. E.....Preston
Snesrud, A. G.....Yankton, S. D.
Snyder, Paul R.....Preston
Snyder, R. V.....Glen Lake, Hopkins
Sorenson, S. .....Osseo
Soltsad, H. P.....Fisher
Solem, O. A. Th.....Halstad
Solseth, Ed. A.....Watson, Box 182
Sonstelie, Emil .....McIntosh
Solomonson, Herman .....Nicollet
Sorens, Wm. .....Bay City, Wis.
Sorensen, A. P.....Lakeville
Sorenson, Otto A.....Albert Lea
Sorenson, Adolph .....Chatfield
Solie, Magne .....Oakland, Wis.
Sommers, Chas. L.....
.....6th & Wacouta Sts., St. Paul
Sorenson, C. A.....Little Falls
Sogge, L., M. D.....Windom
Sovereign, A. J.....N. P. Ry., Staples
Soliah, E. M.....Hatton, N. D.
Spates, S. R.....Wayzata
Sprague, Mrs. L. E. P..509 8th Av. SE., Mpls.
Sparre, Erick, ...Elk River, R. 3
Sperr, Fred .....Donnelly
Spadino, Fred .....St. Paul Park
Spiten, O. G.....Hayfield
Specht, F. H.....Springfield
Sprague, Ed .....Madelia
Spright, H. W.....Porter
Sprague, Clifford .....Madelia
Spang, Ben .....Marshall
Spanks, Rev. Cecil .....Sleepy Eye
Spriestersbach, E. A.....Luverne
Stai, Chas. R.....705 Torrey Bldg., Duluth
Staacke, H. C.....Marble
Stange, F. .....510 4th Av. S., St. Cloud
Stair, J. E..1055 Chamber of Commerce, Mpls.
Starr, Elizabeth .....1906 Colfax S., Mpls.
Stafford, H. L....246 6th Av. N., Fargo, N. D.
Stangler, Joseph, Jr.....Kilkenny
Stangl, Carl.....St. Cloud
Stevens, Geo. .....610 Sellwood Bldg., Duluth
Steffens, C. H.....Racine
Steller, G. F.....Excelsior
Steen, John .....Triumph
Stevenson, A. P.....Dunston, Man.
Steiner, John .....Iona
Steller, Carl G.....Excelsior
Stewart, Prof. John.....St. Anthony Park
Steward, Rollin..:.....812 4th St. SE., Mpls.
Stelter, A. L.....Rosemount
Stemsrud, M. A.....Madison
J. S. Stearns Lbr. Co.....Odanah, Wis.
Stevers, Mrs. F. W....1712 E. Lake St., Mpls.
Stevens, B. T.....2812 S. Fremont, Mpls.
Stebbins, Vera .....320 Oak Grove St., Mpls.
Stenerson, S. A.....Lakeville
Stevens, C. E.....Excelsior, R. 3
Stevens, H. W.....Hopkins
Stenshoel, Phillip .....Canton
Stern, R. .....3757 Girard N., Mpls.
Steele, F. E.....Judd, N. D.
Stearns, Geo. .....Rogers, N. D.
Stewart, Ed. .....Langdon, N. D.
Stennes, A. S.....Erksine
Stennes, E. F.....Halstead
Stevenson, M. J.....Morris, Man.
Steele, Hugh ....405 Manhattan Bldg., Duluth
Stemple, Aug. .....St. Peter
Steffen, W. C.....Detroit
Stevens, H. G.....Cloquet
Steichen, N. .....Pelican Rapids
Stearns Mrs. Henry.....
.....423 S. 19th Av., E. Duluth
Stockwell, S. A.....3204 E. 51st St., Mpls.
Stork, W. E.....368 S. Cleveland Av., St. Paul
Street, B. G.....Hesper, Iowa
Strader, W. M.....Mankato, R. 6
Strunk, A. F.....Windom
Stowe, J. M.....Davidson, Sask., Box 227
Stryker, Mrs. J. E.....
.....Pioneer Press Bldg., St. Paul
Stoa, Martin.....Albert Lea
Stromsedt, O. N.....Willmar
Stout, W. H.....Osseo
Strand, A. K.....Twin Valley
Stickney, G. N.....600 Oneida, Blk., Mpls.
Stolpmann, John T.....Bigstone, S. D.
Stryker, John D.....
.....Woodland Av., Hunters Park, Duluth
Stulz, Rev. W. M.....Sleepy Eye

Digitized by Google

Stillwell, John A.....Arago
Stull, L. B.....Mazeppa
Strate, E. B.....658 Plum St., St. Paul
Streissguth, T. C.....Arlington, Box A
Street, Wm.....Anoka
Street, Wm.....Beltrami
Street, Stephen A.....Albee, S. D.
Sturman, Wm.....Delano
Stockwell, Arlie.....Owatonna
Stockton, W. I.....Anoka
St. Paul Public Library.....St. Paul
Stoddard, D. G..44 St. W. & France Av., Mpls.
Stread, Miss Anna M..Univ. Farm, St. Paul
Strunk, Miss Josephine.....Shakopee
Strom, G. E..1602 W. Minnehaha St., St. Paul
Sundberg, Chas. A.....Worthington
Sucker, Adolph.....Lewisville
Sundit, Peter C.....Flaming
Suhr, H. C.....Mantorville
Suderburg, Carl.....Wayzata, Box 3, R. 1
Sundby, C.....Duluth
Suft, Olek.....Heron Lake
Subilia, Henry A.....Tracy
Swedberg, J. S.....White Bear Lake
Swenson, Gunder.....Norway Lake
Swanson, C. E.....Cannon Falls
Swenson, O. C.....Peterson, R. 1
Swenson, Chas.....Braham
Swanson, Peter.....Excelsior
Swanson, Albert.....Swea City, Iowa
Swearingen, Geo. T.....Madison Lake
Swahn, A.....Ellsworth, Wis.
Swann, J. R.....Madison
Swanson, Chas.....Gladstone, R. 1
Swain, H. O.....Excelsior
Swedberg, J. E.....Battle Lake, R. 2
Swenson, Edwin.....Smithville
Swarnelson, Carl.....Lafayette
Swanson, C. W.....Lafayette, Box 29, R. 1
Swenson, Adolph.....Lake Park
Swett, Mrs. A. H.....315 5th St. SE., Mpls.
Swanson, Arthur L.....New Richmond, Wis.
Swalestad, B. H.....Hillsboro, N. D.
St. John, A. M.....Lakefield
St. Amant, W. J.....4716 Lyndale S., Mpls.

Taylor, M. F.....Anoka
Taubert, M. C.....North Redwood
Talcott, Mrs. A. L.....Westbrook
Tallackson, Nels.....Willmar
Tansaw, Y.....White Bear Lake
Taylor, W. B.....Virgil, S. D.
Taylor, L. A.....Belle Plaine
Taylor, S. E.....Fairmount, N. D.
Taylor, Huntington.....Cloquet
Tabott, E. M.....Amboy
Taylor, Geo. F.....Excelsior
Taylor, John W.....206 Globe Bldg., St. Paul
Taber, W. M.....Park Rapids
Tauber, And.....Sauk Rapids
Talbot, Jos.....Rogers
Taylor, Geo. S.....
..care Chase Bros. Co., Rochester, N. Y.
Terry, L. W.....Howard Lake
Teisberg, Morten H.....Ashby
Teigen, O. T.....Zumbrota
Tessien, Leuie J. F.....Jackson
Tewes, Fred.....Mazeppa
Terhell, Henry.....Milroy
Thompson, F. S.....234 Sec. Bldg., Mpls.
Thielman, Geo.....Excelsior
Thibault, Henry.....Faribault
Thunstedt, John.....Willmar
Thayer, A. P.....Hammond, Wis.
Thomson, Th. I.....403 Evanston Bldg., Mpls.
Thompson, O. A.....Edgeley, N. D.
Thiebaut, Rev. C.....Browns Valley
Thorp, Col. Freeman.....Hubert
Thorne, Wm.....214 Dakota St. W., St. Paul
Thomas, Chas. J.....Frazee
Thompson, Dr. C. S. W.....
.....137½ Main St., Helena, Mont.
Throolin, P. J.....Col. Hghts., Box 48, Mpls.

Thompson, Geo. R.....Chatfield
Thomas, Paul H.....Rochester
Thomas, E. L.....Vergas
Thompson, C. G....1680 Capitol Av., St. Paul
Thomas, Geo. O.....Mabel
Thatcher, F. H.....Winona
Thornton, M. J.....Deer River
Thorpe, Ralph .....2837 Central NE., Mpls.
Theis, John .....Cold Springs
Thoma, W. B.....Racine
Thompson, Howard .....Barney, N. D.
Thornton, F. C.....Benson
Thorgerson, Ole.....Hanley Falls
Thompson, J. S.....1015 13th Av. SE., Mpls.
Thornton, M. P.....Worthington
Tingley, W. J.....Forest Lake
Tillotson, Mrs. H. B..1320 5th St. SE., Mpls.
Tillisch, J. F. F.....Renville
Tierney, D. P.....Capitol, St. Paul
Titus, Albert T.....Robbinsdale
Titterud, O. H.....Preston
Tillinghast, E. S.....Hibbing
Torgerson, H. P.....Astoria, S. D.
Tollefson, Tollef. .....Hanley Falls
Tomalin, W. H.....Inskter, Man.
Towle, P. J.....
..Care Towle Maple Products Co., St. Paul
Totusek, Frank J.....Silver Lake
Totman, W. N.....510 Bd. of Trade, Duluth
Tollefson, M. C.....Willmar
Torgerson, Dr. W. B.....Greenbrush
Tomlinson, W. H.....LeSueur
Tollefson, Ole .....Preston
Towney, C. F....1101 E. Lawson St., St. Paul
Trenham, N. J.....Alexandria
True, Fred O.....Mankato
Trumble, H. W.....Sherburn
Trowbridge, Milo E.....St. James
Trabert, Chas. L.....
..... 2736 Elmwood Av., Berkeley, Cal.
Trinka, J. A.....LeSeuer Center, Box 224
Trafton, Gilbert H., Mankato (S. Nor. School)
Triplett, H. M.....Ogilvie
Traub, Paul .....1359 Vine Place, Mpls.
Tschieda, Mat.....St. Cloud
Tucker, John S..Minnehaha State Bank, Mpls.
Turner, H. H.....Northfield
Tuskind, C. O.....Davenport, N. D.
Tulley, A. .....Kasson
Turtledal, H. A. .....Lyle
Turner, Clarence, J. .....St. Peter, R. 2
Tulledge, Everett G.....Oakfield, Wis.
Tyacke, Geo.....Proctor

Unze, Geo. .....Shakopee
Unumb, P. O.....Alexandria
Ueland, M. K.....Shelly
Undlin, Iver C.....Madison
Undlin, Jens .....Madison
Ulrich, Nick .....Jackson
Univ. of Washington .....Seattle, Wash.
Uptagraft, LeRoy.....West Concord
Ulrich, Henry .....Biscay

Vangen, Peter O.....Climax
Vandergon, D. D.....Maple Lake
Van de Bogart, W. S.....Zumbrota
Van Vick, John .....Spiritwood, N. D.
Vavrichek, A. V.....Dodge Center
Vandermarck, Mrs. C. W.....
.....818 Albert St., Crookston
Varh, Jos. .....Shakopee
Van Sloun, Peter .....Chaska
Van Eaton, John .....Pipestone
Van Ornam, Rome B.....North Calais, Vt.
Vanderhas, J. .....White Bear Lake, R. 1
Vawser, A. T.....Linden, S. D.
Van Dyke, Dr. A. A.....
.....708 Ger. Life Bldg., St. Paul
Valleau, Dorney .....
.....Univ. Farm, St. Anthony Park
Van Patter, John.....Warba
Vaux, E. J.....Faribault

Digitized by Google

Van Alstine, J. O.....Hastings
Van Nuland, Peter .....Solem, N. D.
Vanstrom, John A.....Clarkfield
Vander Velden, Geo. G. M.....Canby
Van Antwerp, Wm.....Dent
Veit, Fred .....Fergus Falls
Verplank, E. E.....New Richland, R. 1
Viall, Roy .....Spring Valley
Vierling, E. J.....Shakopee
Vine, P. O.....Porter
Virginia & Rainy Lake Co.....Virginia
Viel, Raymond .....St. Laurent, Man.
Vierling, M. A.....824 Hall Ave., St. Paul
Vikse, Ole .....Ostrander
Vibert, Percy .....Cloquet
Vincent, G. E.....Univ. of Minn., Mpls.
Volkmer, Henry .....Holdingford
Volstad, K. H.....Lyle
Vollenweider, Henry .....LaCrescent
Voth, Henry .....Goodhue
Vogt, C. F.....6th & St. Peter St., St. Paul
Vogel, Mrs. W. F.....Prior Lake
Von Herff, ... 448 Monadnock Blk., Chicago
Volz, John .....New Ulm, R. 1
Vry, John .....Faribault
Vrieze, Garrett .....Preston

Wade, R. H.....Odin
Wakefield, W., M. D.....Lake Benton
Wagner, Herbert C.....Chaska
Weflen, Christopher .....Montevideo, R. 5
Walgren, Swan J.....Hasty
Walden, J. M.....Northfield
Walfram, A. C.....Belle Plain
Walsh, E. M.....Crookston
Wallner, Berthold, Jr....3553 4th Av. S., Mpls.
Walker, Chas. E.....Glencoe
Walters, Alex. .....Litchfield
Walhus, Martin .....Mabel
Wallace, C. H.....Homer, Ill.
Waller, Wm. G....252 W. George St., St. Paul
Walters, E. C.....21 W. 34th St,, Mpls.
Watt, John .....Leonard, N. D.
Wampler, A. J.....White Bear
Washburn, W. O....1082 Summit Av., St. Paul
Wattner, A. A.....Canby
Wartman, Chas. .....Chaska
Washburn, Prof. F. L.....St. Anthony Park
Washburn, Elwin .....Spring Valley
Wanous, Frank R.....Glencoe
Washburn, Mrs J. L.....
....101 Oxford St., Hunters Park, Duluth
Ward, F. A.....Fairmount
Warren, Mrs. Geo.....3443 Irving S., Mpls.
Ward, Edward .....Fergus Falls
Wanlass, Jos., Jr.....Mindoro, Wis.
Washington, Wm. .....Maple Plain
Wayland, E. R.....Fort Williams, Ont.
Ward, Thomas .....Bryant, S. D.
Warren, A. E.....
..Canadian Northern Ry., Winnipeg, Man.
Ward, D. M.....Montevideo
Weber, John .....Murdock
Weld, J. O.....1601 Fremont N., Mpls.
Webster, D. C.....LaCrescent
Webb, H. L.....Glyndon
Welke, Sam.....Fall Creek, Wis.
Wedge, Robt. C.....Albert Lea
Weld, Mrs. H. E.....Moorhead
Weissman, John J.....Hopkins, R. 2
Webster, F. B.....Roberts, Wis., R. 1
Wells, J. Ray.....Herman
Weinhagen, Chas.....361 Bates Av., St. Paul
Weiss, Peter.....Jackson
Weinholtz, A. C.....Excelsior
Webster, J. K.....St. James
Webster, Mrs. D.....2216 Bryant S., Mpls.
Weider, A. J.....Newport
Wells, Prof. W. S.....River Falls, Wis.
Welter, John.....Morgan
Wells, A. B.....Excelsior
Welander, N. O.....1530 E. Franklin, Mpls.
Wenholz, Fred.....Brook Park
Weber, S. E.....Tyler
Wellhousen, Ernest.....Lake Park, Iowa
Wedge, A. G., Jr.....Bemidji
Weckwerth, Louis F.....Gaylord
Westergaard, P. J.....Belgrade
Weyerhaeuser, F.....
.....212 N. G. A. Bk. Bldg., St. Paul
Westby, H. C.....Madison
Weyerhauser, F. E.....
.....N. G. A. Bk. Bldg., St. Paul
Westfield, Kasper.....Canby
Weyerhauser, R. M.....Cloquet
Westergaard, Louis.....Buffalo, N. D.
West Central School of Agri.....Morris
Wetzel, Aug.....Rouan, Mont.
Wheeler, Miss Gerda .....Sandstone
Whetstone, Dr. Mary S....608 Nic. Av., Mpls.
Wheeler, F. M.....
.....608 Pioneer Press Bldg., St. Paul
Wheeler, H. C.....Hinckley
Wheeler, W. E.....3401 Irving S., Mpls.
Whiting, Geo. H.....Yankton, S. D.
Whipps, L. L.....LeSueur Center
White, R. A.....Twin Lakes
White, R.....Weaver
Whitney, Geo. G..420 Germania Life, St. Paul
White, Miss Emma V..3010 S. Aldrich, Mpls.
White, C. H.....Excelsior
Whiting, D. J.....Northfield
Whitburn, Henry .....Marble
Whitted, Miss H. B.....34 5th St. S., Mpls.
Whipple, W. M.....Mazeppa
Whitney, A. C....9th and Western Av., Mpls.
Wicklund, John.....Atwater
Wiegel, H. A.....Magnolia
Wicklund, John.....Isanti
Wiehe, C. F....Edward Hines Lbr. Co., Mpls.
Widman, John.....Woodstock
Widmoyer, W. S.....Dresbach
Wig, Peder M.....Montevideo, R. 5
Wichman, Frank .....
.....First National Bk. Bldg., St. Paul
Willcuts, R. J.....Holyoke
Wilen, Chas.....Argyle
Wilson, Oscar.....Underwood
Willis, Rev. Francis.....Excelsior
Wilken, W. H. 276 Francisco Av., Chicago, Ill.
Wilwerding, Anton.....Freeport
Wilbur, D.....Floyd, Iowa
Williams, M.....Staples
Will, O. H.....Bismark, N. D.
Wilder, C. B.....Floodwood
Wilder, Mark L.....Mankato
Wilwerding, Nick.....St. Joseph
Willius, F. 514 N. G. Am. Bk. Bldg., St. Paul
Willard, D. E.....N. P. R. R., St. Paul
Will, Wm.....Beltrami
Wilson, J. F.....Cloquet
Willson, Chas.....Glencoe
Willard, E. C.....Mankato
Wilcox, A. E.....Bricelyn
Williams, Niles S...Bradley St. Sta., St. Paul
Wilmarth, Mrs. D....Seven Corners, St. Paul
Wilson, Wm.....Indian Head, Sask.
Willis, C..care Orange Judd Farmstead, Mpls.
Wilson, A. D.....St. Anthony Park
Wilson, Fred.....Sta. F, R. 2, Mpls.
Wilcox, Mrs. E. W.....
....1276 Raymond Av., St. Anthony Park
Wilson, Geo.....Edina
Wildung, W. H.....Howard Lake
Wildhagen, F. O.....Waterloo, Iowa
Will, Hugh .....P. O. Box 29, Mpls.
Williams, Mrs. D. H..5619 London Rd., Duluth
Williams, Jno. G.....Duluth
Wilkelmi, F. W.....Cloquet
Williams, L. R.....Annandale
Wilson, F. M.....Anoka
Willis, Robt.....Marietta
Wilkenson, Herschel E.....
..735 Maybury Grand Av.. Detroit, Mich.
Wirth, Theo.....3956 Bryant S., Mpls.

Digitized by Google

Witte, H. L. F.....Hopkins, R. 8
Wise, H.....Appleton
Wingate, Mrs. W. S.....Excelsior
Winkley, F. C.....Minn. Loan & Trust, Mpls.
Wishart, J. N.....Mapleton
Winslow, B. H.....Kimball
Wintersteen, C. B....3953 11th Av. S., Mpls.
Winter, T. G.....418 Groveland Av., Mpls.
Winnipeg Public Library.....Winnipeg, Man.
Wiswall, Thos.....Gooby, S. D
Witte, Fred.....Hopkins, R. F. D.
Wisner, J. F. 645 Chapin Court, Rockford, Ill.
Woeste, Victor.....Melrose
Woessner, Wm.....Elbow Lake
Wold, Erick .....Greenbush
Woldholm, Mrs. Geo.....Nashua
Wood, A. L.....Rothsay
Woodbury, Mrs. L.....Zumbrota
Woodruff, C. O.....Excelsior
Woodworth, D. B. .....Vermillion, S. D.
Woodworth, F. D.....Driscoll, N. D.
Wood, J. R.....Sauk Rapids
Wood, A. F.....Univ. Farm, St. Paul
Wood, Mrs. Ed.....Gladstone
Woodel, C. F.....Austin
Woodling, Geo.....
.....44th St. and France Av., Mpls.
Woolson, H. C.....Thief River Falls
Wright, A. V.....Mine Center, Ont.
Wright, A. G.....Sta. F, R. 2, Box 159
Wright, Vernon Fuller.....
.....Mt. Faith Av., Fergus Falls
Wright, W. H.....Little Fork
Wrzosek, Frank.....Thorp, Wis.
Wright, C. H.....Pillager
Wright, J. B.....Westbrook
Wyman, A. Phelps..Lumber Exchange, Mpls.
Wyman, Mrs. A. P.....1919 5th Av. S., Mpls.

Yahnke, W A.....Winona
Yegge, C. M.....Alpena, S. D.
Youngberg, C. A.....Cannon Falls
Yates, L. B.....Madelia
Yale Forest School.....New Haven, Conn.
Young, Robt.....Raymond, S. D.
Young, P. W.....Prosper
Younker, Mike.....Jackson
Yager, Louis .....N. P. R. R., St. Paul

Zuercher, F.....Excelsior
Zimmerman, Jule.....Minneiska
Zentz, D. W.....Thurmont, Md.
Zrust, Anthony.....Silver Lake
Zachritz, Geo. P.....Excelsior
Zalk, Zigman ....326 S. 17th Av. E., Duluth
Zierman, Wm.....Delano
Zimmerman, J. W.....Racine
Zeiske, C. A.....Westbrook
Zins, C.....Fulda
Zitzow, Theo.....457 Goodhue, St. Paul

Life Members.

Adams, Mrs. Louisa...1827 Irving N., Mpls.
Ahneman, Geo. F.....Mazeppa
Alin, Alex.....Fullerton, N. D.
Anderson, G. A.....Renville
Anderson, Rev. J. W.....Sidney, Mont.
Andrews, C. H.....Faribault
Arneson, A. N.....Wegdahl
Arnold, L. B.....24 Butte Av., Duluth
Aspden, H. H.....Excelsior

Bailey, E. G.....
....Excelsior R. 1, care W. C. Rockwood
Baker, Geo. A.....Janesville
Barsness, J. A.....Kenyon
Bassett, A. K.....Baraboo, Wis.
Beebe, H. U.....Lake City
Benham, R. H.....215 Palace Bldg., Mpls.
Benson, Edwin .....Jackson
Berrisford, E. S.....386 Robert St., St. Paul
Blain, H. J.....Maple Plain
Boler, Jno.....Bisbee, Ariz.
Boughen, W. J.....Valley River, Man.
Boushka, Frank .....Biscay
Brady, T. D.....Medford
Briard, F. W.....Gaylord
Briggs, A. G.....G. N. Ry., St. Paul
Brink, C. C.....West Union, Ia.
Burton, Miss Hazel.....Deephaven

Cady, Prof. LeRoy.....Univ. Farm, St. Paul
Carlisle, S. A.....Wyoming
Cashman, M. R.....Owatonna
Cashman, T. E.....Owatonna
Chambers, Rev. R. F.....Jackson
Cheney, John .....Morton
Chrisman, Chas E.....Ortonville
Christensen, P. C.....Fairmount
Clarke, Fred H.....Avoca
Cline, Wm. .....Bertha
Cooper, Madison.....Calcium, N. Y.
Crosby, S. P.....Globe Bldg., St. Paul
Cummins, J. R..... .3027 Pleasant Av., Mpls.
Cutting, F. E.....Byron

Danforth, Wm.....Eau Claire, Wis.
Daniels, R. L.....Cannon Falls
Davey, Dr. Flora M....500 Medical Blk., Mpls.
Dickerson, Wm.....Elk Point, S. D.
Doerfler, Rev. Bruno.....Muenster, Sask.
Doughty, J. Cole.....Lake City
Dressler, Otto W.....428 Russell N., Mpls.
Drew, Prof. J. M.....Univ. Farm, St. Paul
Drum, S. H.....Owatonna
Dunsmore, Henry .....Olivia
Dunwoody, Wm. H.....
.....104 Groveland Terrace, Mpls.
Durbahn, A .....Sleepy Eye

Eddy, W. H.....Howard Lake
Ekloff, John .....Cokato
Eliason, M. A.....Artichoke Lake
Engman, Nels.....4510 52nd St. E., Mpls.
Evans, Sheldon J.....LaCrescent

Flannery, Geo. P.....2416 Blaisdell, Mpls.
Fletcher, F. F.....2816 W. 44th St., Mpls.
Fossum, G..... Cottonwood
Foster, Wesley S.....Milaca
Fournelle, Peter.....White Bear Lake
Franklin, A. B.....Sta. F, R. 1, Mpls.
Fuller, F. C.....Madison, S. D.
Fulton, T. C.....White Bear Lake
Funke, J. L.....Wabasha
Gale, Ed. C.....Security Bldg., Mpls.

Gates, A. H.....Rice
Geiger, Wm. C.....
.....520 W. Van Buren St., Chicago, Ill.
Gjemse, L. J.....Cannon Falls
Gjestrum, M. L.....Mankato
Glaeser, Mrs. Imelda.....Owatonna

Haatvedt, A. A.....Hoffman, R. 1
Hagen, O. W.....Sleepy Eye
Halbert, Geo. T.....206 S. 4th St., Mpls.
Hall, D. S.....Buffalo Lake
Halvorson, Halvor .....Hills
Hannah, Robt.....Fergus Falls
Harris, Geo. W.....McHugh
Harris, E. E.....Onlaska, Wis.
Harris, F. I.....LaCrescent
Harrison, C. S.....York, Neb.
Harrison, J. F.....Excelsior
Hart, W. H.....Owatonna
Hartman, M. B.....661 Plum St., St. Paul
Hawkinson, Chas. .....Wayzata

Digitized by Google

Hawley, T. C.....504 E. Elm St., Lodi, Cal.
Hermanson, Herman .....Hopkins
Herrick, U. G.....Carrier 54, Mpls.
Hilstad, O. C.....Nicollet
Hobart, A. W.....1412 36th St. W., Mpls.
Hoverstad, T. A.....1355 E. 57th St., Chicago
Howrad, J. A.....Hammond
Hunter, C. C.....44 S. 10th St., Mpls.
Hendrickson, N.....Audubon

Irish, Prof. H. C.....
Care Title Guaranty Bldg., St. Louis, Mo.

Jager, John.....5241 Upton S., Mpls.
Jerabek, J. S.....Hutchinson
Jewell, Mrs. B.....Dalbo
Johannesson, L .....Beltrami
Johnson, A. A.....Winnebago
Johnson, Gust.....2620 E. 22nd St., Mpls.

Kankel, Otto.....Sta. F, R. 2, Mpls.
Kennedy, J. H.....Sheyenne, N. D.
Kerns, G. F.....Fairmont
Klingel, Rev. Clement.....St. Anthony, Ind.
Knight, H. G.....LeRoy
Korista, J. S.....Silver Lake
Krier, T. N.....Farmer, S. D.
Kueker, Wm. .....Faribault

Larson, C. L.....Winthrop
Larson, Louis M.....St. Louis Park
Larson, Lars M.....Faribault
Lien, Thos. J.....Delavan
Lingen, Carl .....Starbuck
Loftness, A. G.....Thief River Falls
Longyear, E. J.....Excelsior
Loose, E. C.....Luverne
Loring, A. C.....202 Clifton Av., Mpls.
Loring, Mrs. C. M.....100 Clifton Av., Mpls.
Lowe, J. W.....Fairmont
Ludescher, J. L.....Rockford
Lund, I. E.....Hopkins
Lundgren, Mrs. E. E...591 Olive St., St. Paul
Lyman, A. B.....Excelsior
Lyndgaard, Jorgen.....Lake Benton
Lyon, Jay F.....Elkhorn, Wis.

Macauley, T. B.....Montreal, Can.
Mackintosh, Prof. R. S.....Caledonia
Maher, John W.....Devils Lake, N. D.
Manda, W. A.....Short Hills, N. J.
Mann, W. P.....Dodge Center
Manner, C. J.....Jerome, Idaho
Manning, Warren H.....N. Billerica, Mass.
Marshall, F. F.....Wheaton
Marso, J. P.....Canby
Mayo, Dr. C. H.....Rochester
Melgaard, H. L.....Argyle
Melinat, Rev. Max.....Odesso
Miller, Albert.....Cannon Falls
Mohr, C. J.....Rapidan
Mo, Hans.....Sleepy Eye
Moorhead, W. W.....Bethany, Mo.
Mosbaek, Ludvig.....Askov
Moyer, L. R.....Montevideo
McComb, Richard.....Aldergrove, B. C.
McCully, Preston.....Maple Plain
McKibben, A. T.....Ramey
McKisson, G. D.....Fairmount
McKusick, John C.....Marble
McTeague, Rev. P.....Brownsville
McVeety, J. A.....Howard Lake

Nehring, Edward .....Stillwater
Neil, V. A.....Carrier 106, Mpls.
Nelson, A. A., Jr.....Atwater
Nelson, B. F.....1125 5th St. SE., Mpls.
Nelson, John A.....Maynard
Noren, Geo. .....Chisago City
Norwood, F. F.....Balaton
Nussbaumer, Fred.....St. Paul

O'Connor, Patrick H.....Barre, Vt.
Older, C. E.....Luverne
Onstine, Frank A.....Harmony
Ortmann, Rev. Anselman.....
.....Villa S. Scolastica, Duluth
Orton, C. J.....Marietta

Pattridge, C. A.....Sanborn
Paulson, Johannes.....Richfield, Sta. F, Mpls.
Pederson, J. S.....Walnut Grove
Peet, Wm.....Boston Blk., Mpls.
Peterson, Geo. A.....Canby
Peterson, J. G.....Kensington
Peterson, K. K.....Rothsay
Peterson, R. M.....Univ. Farm, St. Paul
Peterson, W. A.....Yuma, Ariz.
Peterson, Wm. A.....
....Lincoln & Peterson Avs., Chicago, Ill.
Pfænder, Max.....Mitchell, Neb.
Pond, H. H.....Sta. F, Mpls.
Pond, I. W.....Madelia
Poore, Hamlin V.....Bird Island
Pracna, Frank, 236 Delmas Av., San Jose, Cal.
Prosser, E. M.....Gully

Quammen, Ole S.....Lemmon, S. D.

Randall, E. W.....47 E. 6th St., St. Paul
Renacker, C. J.....Detroit
Regeimbal, L. O.....
.....School of Agri., St. Paul, Box 512
Roberts, Dr. T. S.....1603 4th Av. S., Mpls.
Rood, A. J.....Spring Grove
Rowe, Chas. .....Wayzata
Ruff, D. W. C.....732 Globe Bldg., St. Paul

Saunders, Wm.....Robbinsdale
Savage, M. W.....International Bldg., Mpls.
Savs, Rev. Mathias.....Delano
Sayre, A. M.....Hills
Schaupp, Chas. F.....Wilson
Schenck, A. A.....
.....1203 Farnham St., Omaha, Neb.
Schell, Otto .....New Ulm
Schuster, Ed. W.....Chas. City, Ia.
Schmidt, Dr. G.....Sleepy Eye
Scott, Rev.W. T.....Black River Falls, Wis.
Scranton, Ellsworth .....Montrose
Sebenius, John Uno.....Wolvin Bldg., Duluth
Shellum, A. M.....Hanska
Sherman, E. M.....Charles City, Ia.
Siverts, Peter .....Canby
Skaar, N. O.....Zumbrota
Slingerland, T. S.....Kasson
Slocum, A. M.....Excelsior
Smiley, Daniel.....Mohonk Lake, N. Y.
Smith, E. A.....Lake City
Snyder, Harry.....St. Anthony Park
Snyder, S. W.....Center Point, Ia.
Soholt, Martin .....Madison
Speechly, Dr. H. M.....Pilot Mound, Man.
Spencer, N. V.....Park Rapids
Stacy, F. N.....3115 S. E. 4th St., Mpls.
Stager, Mrs. Jennie .....Sauk Rapids
Stensrud, Hans .....Watson
St. Johns, B. E.....Fairmont
Strand, G. W.....Taylors Falls
Swanson, Aug. S.....Wayzata
Swanson, J. H.....St. James
Swennes, Knute .....Minneota

Tanner, Wm.....Cannon Falls
Teiger, Geo. .....Lowry
Teigland, J. L.....Minneota
Terry, Alfred .....Slayton
Thomas, A. A.....Sleepy Eye
Thompson, Mrs. Ida.....
.....1805 Hewitt Av., St. Paul
Todd, Fred G.....
.....10 Phillips Place, Montreal, P. Q.
Trefethren, F. G.....Medina, N. D.
Treinen, J. P.....Argyle, Box 23

Digitized by Google

Trow, A. W.....Glenville

Underwood, Mrs. Anna B.....Lake City
Underwood, Roy D.....Lake City

Van Antwerp, Edward .....Dent
Van Nest, R. A.....Windom
Voight, L. H.....Hastings
Volstad, Hon. A. J.....Granite Falls
Wagner, J. F.....Bennett, Ia.
Waldron, L. R.....Dickinson, N. D.
Warren, Geo. H.....3443 Irving S., Mpls.
Warren, W. T.....Woodstock
Webb, E. A.....St. Paul
Webster, Mrs. W. F..1025 S. E. 5th St., Mpls.

Wendlandt, Wm. .....Owatonna
Wentzel, A. E.....Crookston
Wentzel, Louie .....Crookston
Wentzel, Wm. F.....Crookston
Weston, W. S.....Faribault
Wheeler, C. F.....Excelsior
White, J. C.....Mabel
Williams, J. G.....931 Endicott St., Duluth
Williams, M. M.....Little Falls
Wilson, Harold S.....Monroe, N. Y., Box 71
Wise, Geo. A.....Mpls., Box 282
Wright, R. A.....Excelsior

Yanish, Edward.....Federal Bldg., St. Paul
Yost, John L.....Murdock

Honorary Life Members.

Bowen, Mrs. Jas.....327 Beacon St., Mpls.
Brackett, A.....Excelsior
Brand, O. F.....Faribault
Bush, A. K.....1014 S. E. 7th St., Mpls.

Cook, Dewain .....Jeffers
Corp, Sidney .....Hammond

Elliot, Wyman .....1412 W. 47th St., Mpls.

Gibbs, Oliver .....3628 Portland Av., Mpls.
Gardner, Chas. F.....Osage, Ia.
Gaylord, Edson.....Nora Springs, Ia.

Hansen, Prof. N. E.....Brookings, S. D.
Henry, Forest .....Dover

Kellogg, Geo. J.....Lake Mills, Wis.
Kenney, S. H.....Waterville

Lacey, Chas. Y.....
.....547 W. Ocean Av., Long Beach, Cal.

Latham, A. W.....3000 Dupont S., Mpls.
Long, A. J.....Morningside, Mpls.
Loring, Chas. M.....100 Clifton Av., Mpls.

Moore, O. W.....Spring Valley

Patten, Chas. G.....Charles City, Ia.
Perkins, T. E.....Red Wing
Philips, A. J.....West Salem, Wis.

Redpath, Thos.....Wayzata
Reed, A. H.....Glencoe
Richardson, S. D.....Winnebago

Schutz, R. A.....LeRoy

Tilson, Mrs. Ida E.....West Salem, Wis.

Underwood, J. M.....Lake City

Wedge, Clarence .....Albert Lea
Wheaton, D. T.....Morris

Honorary Members for 1912.

Moore, Prof. Jas. G.....Madison, Wis.
Beach, Prof. S. A.....Ames, Ia.
Burnap, Col. W. A.....Clear Lake, Ia.

Glidden, A. J.....Hitchcock, S. D.
Speechly, Dr. H. M.....Pilot Mound, Man.
Waldron, Prof. C. B.....Agri. College, N. D.

Digitized by Google

Additions to Library in 1912.

Yearbook, Department of Agriculture, 1910.
Iowa Horticultural Society, Annual Report, 1910.
Nebraska Horticultural Society, Annual Report, 1911.
Virginia State Horticultural Society, Annual Report, 1911.
Nova Scotia Fruit Growers' Association, Annual Report, 1910.
Nova Scotia Fruit Growers' Association, Annual Report, 1911.
Society of American Florists, Annual Report, 1911.
Illinois Horticultural Society, Annual Report, 1911.
Wisconsin State Horticultural Society, Annual Report, 1911.
California State Commission of Horticulture, Annual Report, 1910.
How to Grow and Market Fruit.
New Jersey State Horticultural Society, Annual Report, 1912.
"Lawns," by Leonard Baron.
Fruit Growers' Guide Book by "Favor."
Missouri Botanical Gardens, Annual Report, 1911.
Quebec Pomological and Fruit Growers' Society, Annual Report, 1910.
Royal Horticultural Society, Journal of, October, 1911.
Royal Horticultural Society, Journal of, March, 1912.
Royal Horticultural Society, Journal of, December, 1911.
Windbreaks (Washington), 1911.
Alabama State Horticultural Society, Annual Report, 1912.
New York State Fruit Growers' Association, Annual Report, 1912.
California Fruit Growers' Convention, Annual Report, 1911.
Ontaria Fruit Growers' Association, Annual Report, 1910.
Ontario Fruit Branch, Annual Report, 1910.
Horticultural Societies of Ontario, Annual Report, 1909.
Horticultural Societies of Ontario, Annual Report, 1911.
Florida State Horticultural Society, Annual Report, 1911.
Vermont State Horticultural Society, Annual Report, 1911.

Digitized by Google

Pennsylvania State Horticultural Association, Annual Report, 1911.

Montana Horticultural Society, Annual Report, 1911.

Wyoming State Board of Horticulture, Annual Report, 1912.

Massachusetts Horticultural Society, Annual Report, Part 2, 1911.

Colorado State Board of Horticulture, Annual Report, 1911.

Maryland State Horticultural Society, Annual Report, 1911.

West Virginia State Board of Horticulture, Annual Report, 1912.

British Columbia Fruit Growers' Association, Annual Report, 1911.

Nova Scotia Fruit Growers' Association, Annual Report, 1912.

Yearbook, Department of Agriculture, 1911.

Wisconsin State Horticultural Society, Annual Report, Part 2, 1912.

Royal Horticultural Society, Journal of, July, 1912.

Washington State Horticultural Society, Annual Report, 1912.

American Association of Nurserymen, Annual Report, 1912.

Manitoba Horticultural and Forestry Association, Annual Report, 1911.

Massachusetts Horticultural Society, Annual Report, Part 1, 1912.

Oregon State Horticultural Society, Annual Report, 1911.

State Forester, Annual Report, 1911.

Minnesota State Agricultural Society, Annual Report, 1911.

Iowa Horticultural Society, Annual Report, 1911.

Michigan Horticultural Society, Annual Report, 1911.

Wisconsin State Horticultural Society, Annual Report, 1912.

Digitized by Google

INDEX

A

	PAGE
Anderson, G. A., Apples for Commercial Orchard, Their Planting and Care	401
Andrews, Gen. C. C., Constitution, Amendments for Reforestation	350
Annual Meeting, 1911, A. W. Latham, Secretary	1
Annual Meeting, 1911, Northeastern Iowa Horticultural Society, J. M. Lindsay	502
Annual Members, List of	521
Apple Growing, Commercial, in the Middle Northwest, Prof. Jas. G. Moore	180
Apples for Commercial Orchard, Their Planting and Care, G. A. Anderson	401
Apples on Sandy Soil, Col. Freeman Thorp	68
Apples, My Experience with a Carload of, F. W. Kimball	29
Apples That Are Not Marketable, Uses of, Emil Sahler	292
Arrowood, Jas., Nevis Trial Station	125
Arrowood, Jas., Nevis Trial Station, Mid. Rep	268
Ashby, H. M., Spraying Materials and Foliage Injury	225
Aster Diseases, Combating of, Mrs. R. R. Odell	339
Award of Premiums, Annual Meeting, 1911	35
Award of Premiums, Summer Meeting, 1912	246
Award of Premiums, 1912, Minnesota State Fair	432

B

Baldwin, H. J., Vegetable Garden	116, 157, 198, 238, 278, 295
Beach, Prof. S. A., Orchard Management	281
Beebe, H. U., Spraying	228
Beta Grape and Its Origin, Wm. Pfænder, Jr	12
Brackett, A,. No Hardy Trees without Hardy Roots	464
Breeding Fruits, Notes on, Chas. G. Patten	8
Brown, Frank, Paynesville Trial Station	127
Brown, Frank, Paynesville Trial Station, Mid. Rep	271
Brown, J. P., Three Hardy Perennials for Minnesota	461
Butler, Miss Eloise, Cultivation of Native Ornamental Plants	365
Butler, Miss Eloise, List of Native Ornamental Plants	370
Burnap, W. A., Trees and Tree Planting	15

C

Cady, Prof. LeRoy, Annual Meeting, 1912, Winnipeg Horticultural Society	196
Cady, Prof. LeRoy, Central Trial Station	97
Cady, Prof. LeRoy, Central Trial Station, Mid. Rep	254
Cashman, Thos. E, Owatonna Trial Station	126
Cashman, Thos. E., Owatonna Trial Station, Mid. Rep	269
Catalpa Worth Growing in Minnesota, Is the, Clarence Wedge	201
Central Trial Station, Prof. LeRoy Cady	97
Central Trial Station, St. Paul, Prof. LeRoy Cady, Supt	254
Cheyney, Prof. E. G., Annual Report of State Forester of Minnesota	428
Children in Horticulture, Interesting the, S. H. Drum	420
Civic Improvement Work in Lake City, Seventh Year, Mrs. Anna B. Underwood	161
Collegeville Trial Station, Rev. J. B. Katzner	99
Collegeville Trial Station, Rev. John B. Katzner, Supt	255

Digitized by Google

PAGE

Cook, Dewain, Hybrid Plums and What We May Expect from Them..... 133
Cook, Dewain, Jeffers Trial Station..... 110
Cook, Dewain, Jeffers Trial Station, Mid. Rep..... 262
Co-Operation Not Competition the Key to Hort. Success, R. D. Underwood..... 31
Co-Operation, Harold Simmons..... 468
Cowles, F. J., West Concord Trial Station..... 131
Cowles, Fred, West Concord Trial Station, Mid. Rep..... 275

D

DeSmidt, A. A., Vice-President's Report, Ninth Congressional District..... 67
Dorsey, M. J., How Can We Aid Fruit Breeding Movement?..... 183
Dorsey, M. J., Testing Station of Jas. Arrowood at Nevis..... 276
Drainage in the Orchard, Prof. John T. Stewart..... 384
Drum, S. H., Interesting Children in Horticulture..... 420
Duluth Trial Station, A. B. Hostetter, Supt..... 259
Duluth Trial Station, A. B. Hostetter, Supt..... 103
Dunsmore, Henry, Top-Working..... 5

E

Elliot, Wyman, Executive Board, Annual Report, 1911..... 21
Ellison, Miss Sabra M., My Summer in a Garden..... 328
Everbearing Strawberries, Geo. J. Kellogg..... 43
Everbearing Strawberries, Breeding, Harlow Rockhill..... 352
Evergreens for the Dryer Sections of Minnesota, Peter Siverts..... 18
Evergreens on the Farm, Geo. H. Whiting..... 441
Excelsior Trial Station, A. B. Lyman, Supt..... 105
Executive Board, Annual Report, 1911, Wyman Elliot..... 21
Executive Board, Records of, for 1912..... 518

F

Fair, Fruit Exhibits at the County, C. M. Jenson..... 345
Fair, Selecting Fruit for the County, J. M. Lindsay..... 419
Farmer's Fruit Garden and Orchard, Henry Husser..... 414
Flower Premium List, Summer Meeting, 1912..... 118
Flowers, Growing, (a discussion), led by Mrs. H. B. Tillotson..... 389
Fly Trap, The Minnesota, Prof. F. L. Washburn..... 397
Fly, New Methods in Combating the House, Prof. F. L. Washburn..... 214
Forester of Minnesota, Annual Report of State, Prof. E. G. Cheyney..... 428
Fruit Breeding Farm in 1911, Minnesota State, Chas. Haralson..... 174
Fruit Breeding Farm, Minnesota State, Chas. Haralson, Supt..... 253
Fruit Breeding Farm, Minnesota State, Report of Committee Visiting, E. Yanish and E. A. Smith..... 179
Fruit Breeding Movement, How Can We Aid, M. J. Dorsey..... 183
Fruit Exhibit at the St. Paul Land Show, Minnesota, A. W. Latham..... 41
Fruits for Minnesota Planting..... 220
Fruits, Growing New, a discussion, led by Mrs. H. B. Tillotson..... 389

G

Garden, A Plea for the Farmer's, P. M. Peterson..... 444
Gaylord, Edson, Top-Grafting, Past, Present and Future..... 382
Gideon Memorial Tablet, Dedication of..... 247
Glencoe Trial Station, Capt. A. H. Reed..... 107
Glencoe Trial Station, A. H. Reed, Supt..... 261
Gould, Mrs. E. W., Garden Helps.....39, 79, 117, 158, 199, 239, 279, 318, 359, 399, 439, 479
Gould, Mrs. E. W., Minn. Garden Flower Society, An. Rep., 1911..... 520

Digitized by Google

H

PAGE

Haralson, Chas., Growing New Fruits, An Exercise 448
Haralson, Chas., Minnesota State Fruit Breeding Farm in 1911 174
Haralson, Chas., Supt., Minnesota State Fruit Breeding Farm 253
Hardy Trees without Hardy Roots, No, A. Brackett 464
Harris, F. I., LaCrescent Trial Station 112
Horticultural Notes of Last Season, C. M. Jenson 437
Horticultural Notes, E. A. Smith 46
Hostetter, A. B., Duluth Trial Station, Mid. Rep 259
Hostetter, A. B., Trial Station 103
Husser, Henry, Farmer's Fruit Garden and Orchard 414
Henry Husser, Vice-President's Report, First Congressional District 51

I

Inspection Law, Needed Changes in Minnesota Horticultural, H. B. Scammel 325
Irrigation with Lake Muck, Incidents and Anecdotes in Developing, C. R. Sandvig 147

J

Jeffers Trial Station, Dewain Cook 110
Jeffers Trial Station, Dewain Cook, Supt 262
Jenson, C. M., Fruit Exhibits at the County Fair 345
Jenson, C. M., Horticultural Notes of Last Season 437
Journal of Annual Meeting, 1911 481

K

Kandiyohi County Hort. Society, An. Rep., 1911, C. C. Selvig 512
Katzner, Rev. J. B., Collegeville Trial Station 99
Katzner, Rev. Jno. B., Collegeville Trial Station, Mid. Rep 255
Katzner, Rev. Jno. B., Pear Experiment up to Date 377
Kellogg, Geo. J., Everbearing Strawberries 43
Kenney, S. H., Top-Working at Waterville Trial Station 92
Kenney, Seth H., Waterville Trial Station, Mid. Rep 272
Ketchum, C. S., Vice-President's Report, Eighth Congressional District 65
Kimball, F. W., How to Develop a Top-Working Orchard 436
Kimball, F. W., My Experience with a Carload of Apples 29
Kohler, Prof. A. R., Packing and Marketing Apples 307

L

LaCrescent Trial Station, F. I. Harris 112
Lange, Prof. D., A Plea for Our Wild Flowers 23
Latham, A. W., Secretary, Annual Meeting, 1911 1
Latham, A. W., Minn. Fruit Exhibit at the St. Paul Land Show 41
Latham, A. W., Secretary's Annual Report, 1911 513
Latham, A. W., Sec'y., Summer Meeting, 1912 241
Library, Additions to Society, in 1912 541
Life Members, List of 538
Lindsay, J. M., An. Meeting 1911, Northeastern Ia. Hort. Society 502
Lindsay, J. M., Selecting Fruit for the County Fair 419
Lindsay, J. M., The Man Who Buys 374
Loring, Chas. M., The Utility and Beauty of Roadside Trees 155
Lyman, A. B., Excelsior Trial Station 105

Digitized by Google

M

	PAGE
Madison Trial Station, M. Soholt, Supt	114
Madison Trial Station, M. Soholt, Supt	264
Maher, John W,. Evergreen and Deciduous Windbreaks for Western Prairies	142
Market for Fruit, Providing a, D. M. Mitchell	343
Marsh, F. L., My Way with Strawberries	355
Marsh, F. L., Outside Storage Cellars	302
Melons, How a Farmer Grows, Knute Swennes	166
Mid-Summer Reports, Trial Stations	253
Miller, E. B., Small Fruits, an exercise	455
Minnesota as a Fruit Growing State, E. W. Reid	75
Minnesota Garden Flower Society, An. Rep., 1911, Mrs. E. W. Gould	520
Missouri Botanical Garedn, Henry Shaw and the, Prof. L. H. Pammel	216
Mitchell, D. M., Providing a Market for Fruit	343
Montevideo Trial Station, L. R. Moyer, Supt	265
Moore, Prof. Jas. G., Commercial Apple Growing in Middle Northwest	189
My Summer in a Garden, Miss Sabra M. Ellison	328
Moyer, L. R., Native Shrubs and Trees at the Montevideo Trial Station	121
Moyer, L. R., Montevideo Trial Station, Mid. Rep	265

Mc

McCulley, Preston, My Strawberry Field	136

N

Native Ornamental Plants, Cultivation of, Miss Eloise Butler	365
Native Ornamental Plants, List of, Miss Eloise Butler	370
Native Shrubs and Trees at the Montevideo Trial Station, L. R. Moyer	121
Nevis Trial Station, Jas. Arrowood, Supt	125
Nevis Trial Station, Jas. Arrowood, Supt	268
Norenberg, Fred, Early Tomatoes for the Farmer and Gardener	375
Northern Nut Growers' Assn., Nut Culture is Important, Why?	472
Nut Culture is Imporant, Why? Northern Nut Growers' Assn	472

O

Odell, Mrs. R. R., Combating Aster Disease	339
Older, C. E., Vice-President's Report, Second Congressional District	54
Orchard, Developing the Commercial, Harold Simmons	205
Orchard, The Home, G. P. Warber	333
Orchard Management, Prof. S. A. Beach	281
Ornamental Planting for Winter Effects, Chas. H. Ramsdell	321
Owatonna Orchard Trial Station, Thos. E. Cashman, Supt	126
Owatonna Trial Station, Thos. E. Cashman, Supt	269

P

Packing and Grade Bill, Sulzer Apple	407
Packing and Marketing Apples, Prof. A. R. Kohler	307
Packing Apples, Sorting and, C. E. Snyder	290
Palm, Ernest, Tomato Culture	427
Pammel, Prof. L. H., Henry Shaw and the Missouri Botanical Garden	216
Patten, Chas. G., Notes in Breeding Fruits	8
Paynesville Trial Station, Frank Brown, Supt	127
Paynesville Trial Station, Frank Brown, Supt	271
Pear Experiment up to Date, Rev. Jno. B. Katzner	377
Perennials for Minnesota, Three Hardy, J. P. Brown	461
Perennial Plants for Northern Gardens, Six, Dr. H. M. Speechly	70
Perkins, T. E., Frontispiece	opp. 401
Peterson, P. M., A Plea for the Farmer's Garden	444
Pfænder, Wm., Jr., Beta Grape and Its Origin	12

Digitized by Google

PAGE
Philips, A. J., Top-Grafting Apples on the Virginia Crab..... 81
Plant Breeders' Auxiliary, An. Rep., 1911, Clarence Wedge..... 508
Plums for Minnesota Planting, W. J. Tingley..... 277
Plums, Hybrid, and What We May Expect from Them, Dewain Cook..... 133
Pond, H. H., Vice-President's Report, Fifth Congressional District..... 59
Program, Annual Meeting, 1912 475

R

Ramsdell, Chas. H., Ornamental Planting for Winter Effects..... 321
Raspberries, Red, and Their Care, O. H. Seamons..... 410
Reed, Capt. A H., Glencoe Trial Station..... 107
Reed, Capt. A. H., Glencoe Trial Station, Mid. Rep..... 261
Reel, E. G. E., Top-Working Experience..... 412
Reforestation, Constitutional Amendments for, Gen. C. C. Andrews..... 350
Reid, E. W., Minnesota as a Fruit Growing State..... 75
Richardson, S. D., Attitude of Nurserymen toward Top-Working..... 86
Rockhill, Harlow, Breeding Everbearing Strawberries..... 352
Ruggles, Prof. A. G., Spraying Experiments..... 170

S

Sahler, Emil, Annual Meeting, 1912, South Dakota Hort. Society..... 187
Sahler, Emil, Uses of Apples That Are Not Marketable..... 292
Sandvig, C. R., Incidents and Anecdotes in Developing Irrigation with Lake Muck..... 147
Sauk Rapids Trial Station, Mrs. Jennie Stager, Supt..... 129
Scammel, H. B., Needed Changes in Minnesota Horticultural Inspection Law..... 325
Seamons, O. H., Raspberries, Red, and Their Care..... 410
Secretary's Annual Report, 1911, A. W. Latham..... 513
Secretary's Corner.....40, 80, 119, 159, 200, 240, 280, 320, 360, 400, 440, 480
Seedling Apple Contest..... 78
Selvig, C. C., Kandiyohi County Hort. Society, An. Rep., 1911..... 512
Shelter-belts, Drouth Resistance in Trees Suitable for, Prof. C. B. Waldron..... 361
Simmons, Harold, Co-Operation..... 468
Simmons, Harold, Developing the Commercial Orchard..... 205
Simmons, Harold, Vice-President's Report, Sixth Congressional District..... 61
Siverts, Peter, Evergreens for the Dryer Sections of Minnesota..... 18
Small Fruits, an exercise, E. B. Miller..... 455
Smith, E. A., Horticultural Notes..... 46
Smith, E. A., Report of Committee Visiting Minnesota State Fruit Breeding Farm.... 179
Smith, L. W., Vice-President's Report, Fourth Congressional District..... 55
Snyder, C. E., Sorting and Packing Apples..... 290
Soholt, M., Madison Trial Station..... 114
S. D. Hort. Society, An. Meeting, 1912, Emil Sahler..... 187
Soholt, M., Madison Trial Station, Mid. Rep..... 264
Speechly, Dr. H. M., Six Perennial Plants for Northern Gardens..... 70
Spraying, H. U. Beebe..... 228
Spraying Experiments, Prof. A. G. Ruggles..... 170
Spraying Formulas 172
Spraying Materials and Foliage Injury, H. M. Ashby..... 225
Stager, Mrs. Jennie, Sauk Rapids, Trial Station..... 129
Stewart, Prof. John T., Drainage in the Orchard..... 384
Storage Cellars, Outside, F. L. Marsh..... 302
Strand, Geo. W., Treasurer's Annual Report, 1911..... 517
Strawberry Field, My, Preston McCully..... 136
Strawberry Seed and After Care, Sowing, Clarence Wedge..... 358
Strawberries, My Way with, F. L. Marsh..... 355
Summer Meeting, 1912, A. W. Latham, Sec'y..... 241

Digitized by Google

T

PAGE

Summer Meeting, 1912, Notice of..... 235
Swennes, Knute, How a Farmer Grows Melons..... 166
Taylor, J. W., Last Year's Experience at White Bear Lake..... 348
Teigland, J. I., Vice-President's Report, Seventh Congressional District..... 62
Testing Station of Jas. Arrowood at Nevis, M. J. Dorsey..... 276
The Man Who Buys, J. M. Lindsay..... 374
Thorp, Col. Freeman, Apples on Sandy Soil..... 68
Tillotson, Mrs. H. B., Growing Flowers, a discussion, led by..... 389
Tingley, W. J., Plums for Minnesota Planting..... 277
Tomato Culture, Ernest Palm..... 427
Tomatoes for the Farmer and Gardener, Early, Fred Norenberg..... 375
Top-Grafting, Past, Present and Future, Edson Gaylord..... 382
Top-Grafting Apples on the Virginia Crab, A. J. Philips..... 81
Top-Working Discussion..... 156
Top-Working, Attitude of Nurserymen toward, S. D. Richardson..... 86
Top-Working Experience, E. G. E. Reel..... 412
Top-Working, Henry Dunsmore..... 5
Top-Working in Minnesota, Present Status of, W. D. Valleau..... 90
Top-Working Orchard, How to Develop a, F. W. Kimball..... 436
Top-Working at Waterville Trial Station, S. H. Kenney..... 92
Treasurer's Annual Report, 1911, Geo. W. Strand..... 517
Trees and Tree Planting, W. A. Burnap..... 15
Trees, The Utility and Beauty of Roadside, Chas. M. Loring..... 155
Trial Stations, 1911..... 92
Trial Station Reports, 1911..... 121
Two Minute Talks..... 504

U

Underwood, Mrs. Anna B., Seventh Year, Civic Improvement Work at Lake City..... 161
Underwood, R. D., Co-Operation Not Competition the Key to Hort. Success..... 31

V

Valleau, W. D., Present Status of Top-Working in Minnesota..... 90
Vegetable Garden, H. J Baldwin.....116, 157, 198, 238, 278, 295
Vice President's Reports, 1911..... 51
Vice President's Report, First Congressional District, Henry Husser..... 51
Vice President's Report, Second Congressional District, C. E. Older..... 54
Vice President's Report, Fourth Congressional District, L. W. Smith..... 55
Vice President's Report, Fifth Congressional District, H. H. Pond..... 59
Vice President's Report, Sixth Congressional District, Harold Simmons..... 61
Vice President's Report, Seventh Congressional District, J. L. Teigland..... 62
Vice President's Report, Eighth Congressional District, C. S. Ketchum..... 65
Vice President's Report, Ninth Congressional District, A. A. DeSmidt..... 67

W

Waldron, Prof. C. B., Drouth Resistance in Trees Suitable for Shelter-Belts..... 361
Warber, G. P., The Home Orchard..... 333
Washburn, Prof. F. L., Annual Meeting, 1912, Wisconsin State Hort. Society..... 152
Washburn, Prof. F. L., The Minnesota Fly Trap..... 397
Washburn, Prof. F. L., New Methods in Combating the House Fly..... 214
Waterville Trial Station, Seth H. Kenney, Supt..... 272
Wedge, Clarence, An. Rep., 1911, Plant Breeders' Auxiliary..... 503
Wedge, Clarence, Is the Catalpa Worth Growing in Minnesota?..... 201
Wedge, Clarence, Sowing Strawberry Seed and After Care.....358
West Concord Trial Station, F. J. Cowles, Supt..... 131

Digitized by Google

PAGE
West Concord Trial Station, Fred Cowles, Supt..... 275
White Bear Lake, Last Year's Experience at, J. W. Taylor..... 348
Whiting, Geo. H., Evergreens on the Farm..... 441
Wild Flowers, A Plea for Our, Prof. D. Lange..... 23
Windbreaks for the Western Prairies, Evergreens and Deciduous, John W. Maher..... 142
Winnipeg Horticultural Society, Annual Meeting,, 1912, Prof. LeRoy Cady..... 196
Wis. State Hort. Society, Annual Meeting, 1912, Prof. F. L. Washburn..... 152

Y

Yanish, E., Report of Committee Visiting Minn., State Fruit Breeding Farm..... 179

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

THIS BOOK IS DUE ON THE LAST DATE
STAMPED BELOW

AN INITIAL FINE OF 25 CENTS
WILL BE ASSESSED FOR FAILURE TO RETURN
THIS BOOK ON THE DATE DUE. THE PENALTY
WILL INCREASE TO 50 CENTS ON THE FOURTH
DAY AND TO $1.00 ON THE SEVENTH DAY
OVERDUE.

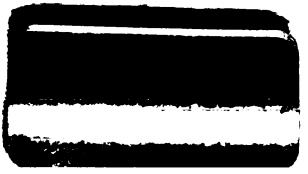
LD 21 4m-9,'33

Digitized by Google

17217 | SB21
Minnesota state horti- | M54
cultural society. | 1911/12

SB21
M54
1911/12

17217
Library, Branch of the College of Agriculture, Davis



Digitized by Google

Digitized by Google